

Hearing in Lansing, MI

Meter Choice HB 4220

March 7, 2017

Good Morning Mr. Chairman and members of the Energy Committee, my name is Carole Garcia from Romeo.

I believe All Utility Customers Should Have a Real Choice to Protect Their Health, Safety & Privacy!

March of last year I had to retire because of all this technology after 39 years, and a medical background.

I am here to express my concerns on these Advanced Microwave Radiating Meter Devices better known as (Smart Meters) and the health effects.

In 2012, I moved to Rochester, after the first six months of living there with two meters on my bedroom wall I started to get very sick. It started off with severe headaches, bloody noses every day, vertigo, nausea, fatigue, brain fog, ringing in the ears, and declining eye site, just to name a few. Prior to moving to Rochester I was a very healthy.

Due to my declining health issues my doctors wrote letters requesting these, meters be removed off my condo. I reached out and sent several notarized, certified letters pleading to the following people to help me get these meters removed off my condo. I reached out to DTE, Robert Sitkauskus, AMI/DTE, Joseph McCormick, Manager, MPSC, Bill Schuette, The Honorable Gail Haines, Aric Nesbitt, the previous House Speaker, and Mayor Barnett in Rochester Hills, with follow up calls amongst others.

As you can see I have tried everything possible to get these meters removed off my home to those in power with no help! I also have

three doctor's letters stating they want the meters off my home and still no help from DTE or the MPSC!

Finally I had to move again from Rochester to Romeo, just to try and protect my health. We cannot continue to move or run from our homes just to be safe, that's why this House Bill is so desperately needed. It's not just about us it's about our children and grandchildren's future as well.

To give you an example, I have been diagnosed with Stem Cell Clonal Disorder, known as Monoclonal Gammopathy of undetermined significance (MGUS) which can turn into bone cancer; my blood tests the past several months have not been good.

Another example, is my daughter in-law who worked as a teacher in a Montessori school while she was pregnant that had WIFI and these Advanced Meters, my grandson was born with a cataract in his right eye and my daughter in-law now, thirty-two years old was diagnosed with Stage 3 Thyroid Cancer, they had to remove twenty-nine Lymph Nodes, which seven had Cancer, she is still fighting this.

There are an increasing number of people young and old who are getting very sick and even dying from this technology that is why we urgently need HB 4220 Meter CHOICE passed. Right now the citizens of Michigan are not giving a choice, and we want one!

The public is waking up to DTE's Dictatorship, and more informed on the health/privacy issues attributed to these microwave radiating smart meter devices, because people are suffering every day!

Mr. Chairman, and members of the Energy Committee, I am asking you to please support and Vote Yes on HB 4220.

It is time for our elected officials to do the right thing for the people who elected them! So many people in the State of Michigan including myself are suffering severely from these Advanced Microwave

Radiating Meter Devices and this technology. We just want to be able to live in good health and prosperity.

I am reaching out to all of you to do the right thing for the people in this great State by supporting and voting Yes on HB 4220 meter choice, and know that citizens all across Michigan are looking up to you, our representatives to do the job you were elected to do and protect us! Thank you!

Sincerely,



Carole Garcia

Romeo, MI

586-281-6244

Mr. Chairman, Committee members, thank you for allowing me to speak. My name is Brock Millard. Last January I received a letter from DTE Energy. The first sentence stated the following: "In the next few weeks, DTE Energy will begin installing advanced metering in your area."

I also received a brochure with some frequently asked questions. I read the brochure and didn't think much of it until I read the following question. "Are there any health hazards associated with the new technology?" DTE response. "No" Now, that is a fair question. The problem was not in the question, but in the answer. It's actually absolute. DTE Energy would have to know how everyone on the entire planet responds to a smart meter. Allow me to put this in perspective. If I said; peanuts are safe for everyone, I would get a few strange looks. Why? Because there are many documented cases of people being allergic to peanuts. What if I said that getting stung by a bee has no health hazards? I would get even more strange looks. As many know, some can die from a bee sting if medical attention is not received. There have been many documented cases of health issues from smart meters. One Michigan example is Georgetta Livingstone, Ph.D. Georgetta received a rash that covered 90% of her body after a smart meter was installed on her home. Her testimony was given back in 2014 to the House Oversight Committee. (According to MLive.com) Jeromy Johnson (former Silicon Valley Engineer) gave a Tedx talk describing health issues. (Google search)

There are several reasons that utility customers should have meter choice. First would certainly be health concerns. Second is privacy. Is a smart meter really a meter or a monitor? A quick Google search of the word monitor will define it as: "an instrument or device used for observing, checking, or keeping a continuous record of a process or quantity." Typing "DTE real time usage" in a Google search will give you a link to go to the DTE Insight App. From there you will read that you can track your usage in real time. The smart meter is certainly "keeping a continuous record of a process" (electricity usage) and quantity (appliance data). One can still purchase a book on eBay titled: Algorithmic Detection of Home Appliances from Smart Meter Data.

The following is taken from the abstract: "Leveraging smart meter data to recognize home appliances"

by Markus Weiss, Adrian Helfenstein , Friedemann Mattern , and Thorsten Staake.

"Several particularly promising applications involve the disaggregation of individual appliances within a particular household in terms of their energy demand."

On December 28, 2016, Bentonville News 5 (KFSM) reported that: "A local murder case is making national headlines...Court documents show investigators believe James Bates cleaned up a murder scene because of the amount of water he used...Heath Ward...said...meters can read data continuously...we do have more technology that actually monitors and takes a reading 24-hours a day for 30 days and you can see the habits, the water habits of the house...Bates' attorney Kimberly Weber...said right now police only have data from a water meter and other devices, but don't have any DNA evidence or a motive."

It is my opinion that the State of Michigan has a law against such devices being placed on a homeowners property without consent. Michigan Penal Code 750.539d states:

(1) Except as otherwise provided in this section, a person shall not do either of the following:

(a) Install, place, or use in any private place, without the consent of the person or persons entitled to privacy in that place, any device for observing, recording, transmitting, photographing, or eavesdropping upon the sounds or events in that place.

On September 14, 2015 DTE Energy filed a report with the MPSC in regards to Case No. U-17936.

The report described Strategies for Education, Outreach, Marketing, and Customer Support of TOU (Time of use) Rates and Other Pricing Options. On page 4 of that report; under Customer Benefits of TOU Rates, there is a quote I would like to read. "Typically, customers who can use more than two-thirds of their use "Off-Peak" will save on their energy bills." Is it practical for the average Michigan resident to be able to shift usage to save any money? **If the entire public was able to shift usage to "Off-Peak" wouldn't the "Off-Peak" now become Peak?** There are many reasons to error on the side of caution and allow residential customers to keep their analog meters. Do you agree?

In the next few weeks, DTE Energy will begin installing advanced metering in your area. This will include upgrading the electric meter at your home or business at no cost to you. In most cases, installation of the new electric meter is simple, requiring a brief, five-minute interruption to your electric service.

You do not need to be present for the meter upgrade, unless the meter is inside your home or business, or inaccessible. A clear path must be provided for us to gain access to our outside and inside metering equipment, which will require all obstructions or obstacles to be removed prior to the meter upgrade.

During the initial installation period, a meter reader will continue to read the meter until your neighborhood is fully upgraded. If you operate life-support or other sensitive equipment that DTE Energy may not be aware of, please contact us at 800-477-4747.

While you may not see a change in service initially, the benefits, as we continue to install the complete advanced metering system, include:

- Access to your energy usage information
- Automatic power outage detection
- Fewer estimated bills
- No need for us to enter your yard or business for meter reading
- Better integration of renewable energy sources

Be assured that the usage data obtained from the meter is fully encrypted and is only used for billing purposes. **No personal data is collected or stored by the meter.**

The Michigan Public Service Commission has approved a tariff allowing a non-transmitting meter provision commonly referred to as an Opt-Out Program for residential customers. Customers enrolled in the Opt-Out Program will have a non-transmitting, (radio off) digital meter installed and the following fees applied to their account:

- \$67.20 AMI Opt-Out Initial Fee
- \$9.80 AMI Opt-Out Monthly Charge

To enroll in the Opt-Out Program, please call 800.477.4747 to speak with a customer representative.

Our Advanced Metering program is creating the path to your home's energy future. For more information, please visit us online at dteenergy.com/advancedmeter. We look forward to providing you with this new technology and enhanced level of service.

Sincerely,

The Advanced Metering Team

What is advanced metering?

DTE Energy's advanced metering program involves the installation of highly accurate, state-of-the-art metering technology for residential and commercial electric and natural gas customers.

Advanced meters transmit your energy usage information to DTE Energy over a secure communication network.

Advanced electric metering

Over the past few years, DTE Energy has replaced older electric meters with newer digital meters that allow for two-way communication. The new meters give customers better access to tools and information that can help them save money by better managing their energy use.

Advanced natural gas metering

All DTE Energy natural gas meters will be modified with remote-reading modules that are placed on existing natural gas meters. In some instances, natural gas meters may need to be replaced. The natural gas meter module will give us the capability to remotely read the meter without having to enter your property.

Benefits of Advanced Metering

- **Access to your energy usage information** – just register at dteenergy.com to find out how much energy you are using on a daily and even hourly basis. While on our website you can also sign up for ebill or other convenient services.
- **Automatic power-outage detection** – our system automatically receives a signal when the new advanced meters aren't working or have been removed. This makes it easier for us to quickly locate and reduce the length of power outages and other problems. If you have a power outage, please still call us at **800.477.4747** to get a restoration estimate. Always call us if you see a downed wire.
 - If you're planning home renovations or a service upgrade that require your electrician to temporarily remove the electric meter, please notify us at least 30 minutes in advance by calling **800.477.4747**.
- **Fewer estimated bills** – our meter reading rate for advanced meters is above 99 percent. This means you'll be receiving bills each month, based on actual – not estimated use.
- **Increased convenience and privacy** – our meter readers won't need to enter your yard or business to read the meter.
- **Better integration of renewable energy sources** such as solar power, and plug in electric vehicles, into the electric system.

Learn more

For more on advanced metering, visit dteenergy.com/advancedmeter



Connecting you
to cost savings,
convenience
and more....



*Si necesita esta información en español,
llame al número siguiente: 800.477.4747*

إذا كنت تحتاج لهذه المعلومات باللغة العربية،
يرجى الاتصال على الرقم التالي: 800.477.4747

Installation

The new electric meter or natural gas meter module will be installed by either a contractor working on our behalf or a DTE Energy employee. The installer will have identification that shows he or she is a representative of DTE Energy.

You do not need to be home if the electric and/or gas meter is outside and accessible. If the meter is inside your home, an adult must be present during installation.

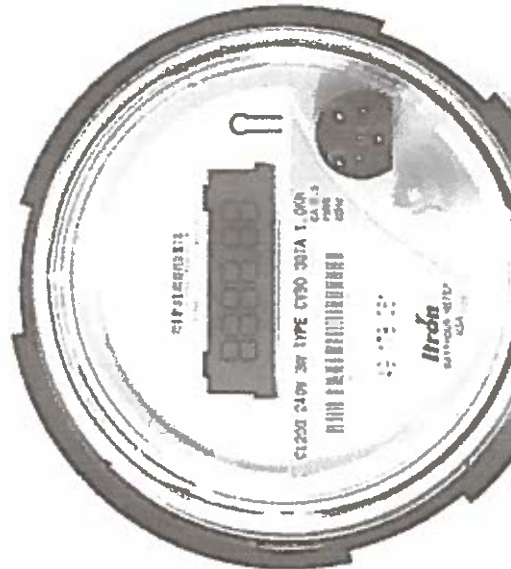
- Electric meter installation – A brief, approximately five-minute interruption of your power will occur.
- Natural gas module installation – No interruption of the natural gas service is needed for installation of the natural gas meter module.

Meter reading

Until installation is complete in your area, a meter reader will continue to read the meter. Your billing cycle will not change.

The new advanced electric meter has a digital display instead of dials. To read the meter, simply look for the screen beginning with the code 004. This screen shows your kilowatt hour meter reading. The other displays show the meter communicating to our operating and billing systems over a secure radio network. A video describing how to read the new advanced electric meter is available on our website.

The method for reading the natural gas meter will not change.

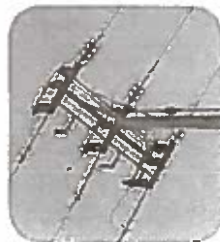


How advanced metering works



The Meter

New advanced meters, which can be read remotely, are installed.



Communications Network

The meter will transmit your energy usage information to us via a secure communication network.



Our Billing System

Meter data is sent to our billing system. Advanced metering technology will virtually eliminate estimated bills.

Your Energy Bill

Your monthly utility bill is generated using the information sent to our billing system.



Manage Your Energy Usage

Once installation in your area is complete, you will be able to monitor and manage your energy usage information online.



Frequently asked questions

Q. Will I have to pay for the new meter or module?

A. No, there is no charge for the meter or installation. If any electric or gas service issues exist on your customer-owned equipment, you will be responsible for the cost to fix the problem before the advanced meter installation can take place.

Q. Who is the installer and how can I be certain this person is authorized to do the work?

A. The new electric meter or natural gas meter module will be installed by a contractor working on behalf of DTE Energy or a DTE Energy employee. The installer will have identification that shows he or she is a representative of DTE Energy. You should immediately report to DTE Energy anyone posing as an installer who requests money for the meter, modules and/or installation. Call us at 800.477.4747.

Q. Are there any health hazards associated with the new technology?

A. No. The equipment operates at a low-power radio frequency, comparable to a cordless telephone. All equipment operates in compliance with state and federal communication standards.

Q. While reading the new meter, will DTE Energy have wireless access to any personal information, such as data stored on my home computer?

A. No, the network being installed will not give us access to your confidential personal information stored on your home computers. This technology does not invade your privacy, which we respect.



Lansing

Michigan residents link smart meters to medical problems, testify in front of legislative committee

By **Emily Lawler** | elawler@mlive.com

on December 02, 2014 at 7:11 PM, updated December 02, 2014 at 7:35 PM

LANSING, MI – Georgetta Livingstone, of Clarkston, has been living for months without electricity, showering at a neighbor's house and driving to Kroger to use the toilet.

When winter got too cold, she started operating a generator to keep her house heated past 30 degrees. She's been threatened with legal action from her homeowners association but says the generator is the only way to live without the smart meter her provider, DTE Energy, wanted her to have.

"The doctors don't know what it is," she says of a rash that once covered 90 percent of her body.

Michigan utility companies are deploying "smart meters," which the Michigan Public Service Commission (MPSC) describes as advanced meters that send readings to a person's utility company automatically, eliminating the need for meter readers and resulting in more accurate billing.

But advocates at a meeting of the House Oversight Committee, chaired by Rep. Tom McMillin, R-Rochester Hills, said the meters cause health problems and privacy issues.

Dominic and Lillian Cusimano didn't even know they had a smart meter at a secondary home until Lillian started getting flu-like symptoms in 2012, Dominic Cusimano said.

"To make a long story short, we were talking to somebody at a Christmas party at the end of 2012 and they said 'I bet you got a smart meter installed at your house,'" Dominic Cusimano said.

Lillian Cusimano said her doctor understood and has diagnosed her with a sensitivity to electromagnetic frequency. The couple is currently in a lawsuit over replacing their own meter.

Bob Sitkauskas of DTE Energy said the company has an opt-out program, but it comes at an additional cost and the other option is still digital, not an analog meter. However, it doesn't communicate a customer's usage wirelessly to the utility company.

Sitkauskas testified that the company had not yet shut off people for refusing smart meters, but had shut off people who installed their own analog meters instead of using the company's meters. In addition, they've sent out letters warning of shut-offs for noncompliance.

"If the situation prevails, it's gonna be a shut off," Sitkauskas said.

The company hasn't purchased analog meters since 2007 and would have trouble finding them through a major supplier, Sitkauskas said.

Lisa DeLacy of Consumer Energy's smart energy program said that for the most part, customers where smart meters have been deployed are reacting favorably.

"Satisfaction levels have grown in Muskegon, Zeeland and Grand Rapids and our customers are now 50 percent more likely to recommend our company to family and friends," DeLacy said.

McMillin said the issue was that since there wasn't a free market for utility services in Michigan, people didn't have an option to go with a company that would give them an analog meter.

"That's why we're here, again, is you're a monopoly," he told Consumers Energy. He also used the word in questioning DTE Energy.

The MPSC, which regulates utilities in the state, held hearings on the meters. However, McMillin said he wanted them to come because he's heard from citizens they were not allowed to air some of their concerns.

MPSC Legislative Liaison Mike Byrne said that the commission got more than 400 public comments and released a report on the meters. The meters comply with health and safety standards and are a more accurate form of metering, he said.

McMillin asked if it was an OK outcome for a person with a working analog meter to have their power shut off for not allowing a smart meter to be installed.

"That utility is within their rights," Byrne said.

West Bloomfield Township Supervisor Michele Economou Ureste said her own family was having problems with the smart meter, including her children.

"In my opinion this health and safety issue is the most important issue in Lansing," Economou Ureste said.

McMillin's is the sponsor of HB 4315, a bill that directly addresses smart meters. However, that bill was not up in committee on Tuesday. It's been stalled in the House Committee on Energy and Technology since February of 2013.

Emily Lawler is a Capitol/Lansing business reporter for MLive. You can reach her at elawler@mlive.com, subscribe to her on [Facebook](#) or follow her on Twitter: [@emilyjanelawler](#).

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December 10, 2016 / Jeromy / 49 Comments ... **TEDx Talk: Wireless Wake-Up Call** ... On February 6th, I had the opportunity to speak at **TEDxBerkeley**. The title ...

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Feb 2016 TEDTalk "WIRELESS WAKE-UP CALL" Jeromy Johnson ...<https://iervn.com/2016/02/.../feb-2016-tedtalk-wireless-wake-up-call-jeromy-johnson/> ▾

Feb 22, 2016 - On 6th February, **Jeromy Johnson**, gave the first ever TEDTalk on wireless/EMF/smart meter health effects at **TEDxBerkeley**. Jeromy has a ...

TEDx Talk: "Wireless Wake-Up Call" | Smart Grid Awareness<https://smartgridawareness.org/2016/02/06/tedx-talk-wireless-wake-up-call/> ▾

Feb 6, 2016 - A **TEDxBerkeley** Presentation about the Health Impacts of Wireless Technology and Proposed Solutions. On February 6th, **Jeromy Johnson**, ...

Jeromy Johnson at TEDx Talks: Wireless Wakeup! - About the Skyaboutthesky.com/smallstorm-blog/524-jeromy-johnson-tedx-talks-wireless-wakeup ▾

Silicon Valley engineer **Jeromy Johnson** was forced to start a new life after becoming EMF sensitive. As a young tech enthusiast, he says he never would have ...

TEDx Talk: "Wireless Wake-Up Call" - ElectraHealth.comwww.stetzerizer-us.com/TEDx-Talk-Wireless-Wake-Up-Call_b_511.html ▾

Feb 23, 2016 - On February 6th, **Jeromy Johnson**, an expert in mitigating the negative impacts of Electromagnetic Field (EMF) exposure, was featured as a ...

Wireless wake-up call. Jeromy Johnson.... - Twenty Lemons Essential ...<https://www.facebook.com/TwentyLemons/posts/1705792373024741> ▾

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Feb 19, 2016 - A Silicon-valley engineer turned technology health advocate, **Jeromy Johnson** discusses our attachment to technology and the health hazards ...

(PDF) Wireless Wake-Up Call: A New Paradigm in EMF Science - Tau Beta Pi<https://www.tbp.org/pubs/Features/Su16Johnson.pdf> ▾

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mon·i·tor

/'mänədə/

noun

1. an instrument or device used for observing, checking, or keeping a continuous record of a process or quantity.
"a heart monitor"
synonyms: detector, scanner, recorder; More
2. a student with disciplinary or other special duties during school hours.
"show the hall monitor your pass"

verb

1. observe and check the progress or quality of (something) over a period of time; keep under systematic review.
"equipment was installed to monitor air quality"
synonyms: observe, watch, track, keep an eye on, keep under observation, keep watch on, keep under surveillance, surveil, record, note, oversee; *informal* keep tabs on
"his movements were closely monitored"



Translations, word origin, and more definitions

Feedback

Monitor | Define Monitor at Dictionary.com

www.dictionary.com/browse/monitor ▼

Monitor definition, (especially formerly) a student appointed to assist in the conduct of a class or school, as to help take attendance or keep order. See more.

Monitorial · Monitoring · Monitor versus merrimack · Monitorship

Monitor Definition - Tech Terms

<https://techterms.com/definition/monitor> ▼

Monitor. The term "monitor" is often used synonymously with "computer screen" or "display." ... Most modern monitors are built using LCD technology and are commonly referred to as flat screen displays. These thin monitors take up much less space than the older CRT displays.

Monitor | Definition of Monitor by Merriam-Webster

<https://www.merriam-webster.com/dictionary/monitor> ▼

Define monitor: a student appointed to assist a teacher — **monitor** in a sentence

Monitory · Monitorial System · Monitor Lizard

What is monitor? - Definition from WhatIs.com

whatistechtarget.com/Topics/ConsumerTech/Peripherals ▼

In computers, a **monitor** is a computer display and related parts packaged in a physical unit that is separate from other parts of the computer. Notebook computers don't have monitors because all the display and related parts are integrated into the same physical unit with the rest of the computer.

monitor Definition from PC Magazine Encyclopedia

www.pcmag.com/encyclopedia/term/47212/monitor ▼

Definition of: monitor (1) A display screen used to provide visual output from a computer, cable box, video camera, VCR or other video generating device.

LCD monitor Definition from PC Magazine Encyclopedia

www.pcmag.com/encyclopedia/term/45974/lcd-monitor ▼

Definition of: LCD monitor. **LCD monitor**. A flat panel screen that uses the liquid crystal display (LCD) technology and connects to a computer. Laptops have ...

Monitor - definition of monitor by The Free Dictionary

www.thefreedictionary.com/monitor ▼

One that admonishes, cautions, or reminds, especially with respect to matters of conduct. 2. A pupil who assists a teacher in routine duties. 3. a. A usually ...

monitor Definition in the Cambridge English Dictionary

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With the DTE Insight app, you can monitor and control your home's energy use. ... [See your usage in real time when you use the DTE Insight app with the DTE Energy Bridge device.](#) ... Armed with the DTE Insight app and Energy Bridge device, Kate was able to pinpoint exactly what was ...

DTE Insight - Android Apps on Google Play

<https://play.google.com/store/apps/details?id=com.dteenergy.insight&hl=en>

★★★★★ Rating: 3.3 - 606 votes - Free

Know Your Own Power DTE Insight is a revolutionary new platform that allows DTE Energy customers with an Advanced Meter to discover and improve their ...

DTE Insight on the App Store - iTunes - Apple

<https://itunes.apple.com/us/app/dte-insight/id886284766?mt=8>

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DTE Insight app offers customers new ways to save on monthly energy ...

www.prnewswire.com/.../dte-insight-app-offers-customers-new-ways-to-save-on-mon-...

Apr 21, 2016 - DETROIT, April 21, 2016 /PRNewswire/ - DTE Energy's award-winning energy savings app - DTE Insight - has launched a new budget ...

DTE Insight App - YouTube


<https://www.youtube.com/watch?v=r80rjl2GQpc>

Apr 22, 2014 - Uploaded by DTEEnergyCompany

DTE Insight - the app that puts real-time home energy usage data at your fingertips. Learn more by visiting ...

DTE app gives customers insight into power usage - Detroit Free Press

www.freep.com/story/money/business/michigan/2015/10/.../dte...insight/73932382/

Oct 24, 2015 - Chidananda Kukunje heard a radio advertisement about four months ago for Insight, a free mobile app that DTE Energy is offering to help ...

[PDF] DTE Insight Smartphone App

www.michigan.gov/.../DTE_Insight_MEMO_White_Paper_06012015_491804_7.pdf

Jun 1, 2015 - DTE Insight Electric Savings Whitepaper - Six Month Analysis Results. 1. Program and Measure Description. 2. Evaluation Methodology. 3.

[PDF] DTE Energy Pilot Programs DTE Insight & Retro-Commissioning

https://www.michigan.gov/documents/mpsc/dte_rcx_042115_487483_7.pdf

DTE Insight mobile app was launched in 2014 and will be a core platform to help our customers manage their energy consumption and their homes. 3 ...

Ryan Pratt - The support for DTE Insight is really... | Facebook

<https://www.facebook.com/dteenergy/posts/10152688996126465>

The support for DTE Insight is really lacking. I was so excited to receive my Energy Bridge, but it's incredibly frustrating to have the setup fail and...

CVE-2016-1562: Unauthenticated "filter" parameter leads to customer ...

jeffq.com/blog/dteenergy-insight/

Mar 10, 2016 - CVE-2016-1562: Unauthenticated "filter" parameter leads to customer information leak in the DTE Energy Insight app ...

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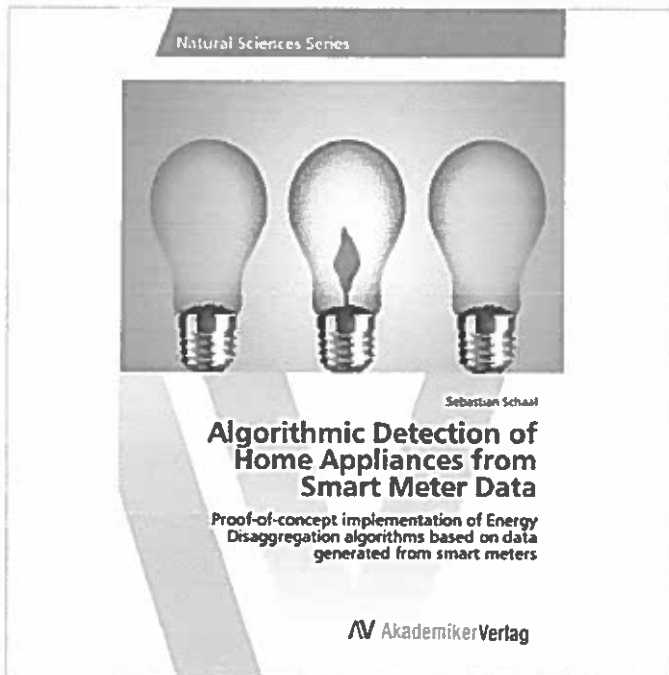
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Ships to: Australia, Americas, Europe, Asia, New Zealand

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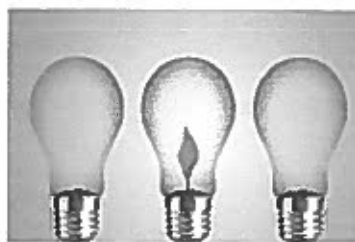
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Algorithmic Detection of Home Appliances from Smart Meter Data

Proof-of-concept implementation of Energy Disaggregation algorithms based on data generated from smart meters

AV AkademikerVerlag

of Energy Disaggregation algorithms based on data generated from smart meters

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Reducing the overall energy waste is one of the most pressing challenges of mankind. The energy consumption of individuals can be reduced by providing them with information about the consumption of single appliances in their household. The field of Non-intrusive Appliance Load Monitoring or Energy Disaggregation detects single devices from aggregated loads. Smart meters provide an easy solution to extract momentary values of the device-aggregated energy consumption for further processing. This publication summarizes a proof-of-concept implementation from data extraction via standard smart meters to the detection of appliances of interest (AOIs). Data extraction is based on a low cost hardware with an extraction computer script. The developed disaggregation algorithms were trained with device parameters to detect three AOIs: freezer, dishwasher, and dryer. Through the generality of the concept, the algorithms could be trained to detect other appliance models or classes. Leveraging standard interfaces, the implementation could be reproduced in different households with an installed standard smart meter.

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Leveraging smart meter data to recognize home appliances

Markus Weiss^{*,#}, Adrian Helfenstein⁺, Friedemann Mattern⁺, and Thorsten Staake[‡]

⁺ Institute for Pervasive Computing
ETH Zurich

[‡] Information Management
ETH Zurich

[#] Engineering Systems Division
Massachusetts Institute of Technology

Abstract — The worldwide adoption of smart meters that measure and communicate residential electricity consumption gives rise to the development of new energy efficiency services. Several particularly promising applications involve the disaggregation of individual appliances within a particular household in terms of their energy demand. In this paper we present an infrastructure and a set of algorithms that make use of smart meters together with smartphones to realize new energy efficiency services (such as itemized electricity bills or targeted energy saving advice). The smartphones, together with a novel filtering approach, much simplify the training process for appliances signature recognition. We also report on the performance of our system that was tested with 8 simultaneous devices, achieving recognition rates of 87%.

Keywords—smart metering; non-intrusive load monitoring; energy monitoring; energy break down; electricity consumption

I. APPLIANCE-SPECIFIC CONSUMPTION FEEDBACK

The requirement to conserve energy, the modernization of the electrical grid infrastructure, and the growing share of electricity from intermittent sources (e.g., wind and photovoltaics) initiated a paradigm shift in the energy domain [1]. As a consequence, smart electricity meters are currently rolled out in many countries. Besides simplifying the meter reading processes for energy utilities, smart meters are seen as enablers for new services, flexible tariffs, and demand response programs in the context of the smart grid.

Smart electricity meters record much more detailed consumption information than classical electricity meters. In current deployments, energy consumption is logged and typically made available to energy utilities and consumers by feedback tools such as web sites or in-home displays. However, the information provided is often limited to the mere visualization of the consumption data, or, at best, augmented with efficiency scales or comparisons with average households. While this may already contribute to energy savings, it fails to unlock the full benefit for consumers, as it does not direct the attention to those appliances or actions that bear high saving potentials.

In this work we propose a scheme that leverages metering data by automatically analyzing the recorded consumption information to provide better-tailored energy feedback at no extra cost. It provides users with an appliance-specific consumption break down. Such device-level information is essential to establish the link between consumption and device utilization, to enable sophisticated energy efficiency services (e.g., targeted automated recommendations), and to reduce residential electricity consumption by enabling users to derive conservation measures.

Most approaches so far have focused on providing this device-level consumption information by deploying sensors at appliances or power outlets. However, this is costly and

the installation of a large number of sensors imposes a high usage barrier. Other solutions are based on a single sensor only, but require technical expertise for their setup, a-priori knowledge of appliance power signatures, and a complex calibration by the user [1].

Our approach tries to overcome these challenges. To facilitate the appliance-specific breakdown, we extended the capabilities of an earlier prototype that connects a smart meter with a mobile phone [2]. We disaggregate the recorded total load to device-level consumption information by applying data analytics to the electricity consumption data that is gathered by the smart meter and by making use of a measurement feature implemented as part of a mobile phone application. This not only enables more meaningful consumption feedback and increases users' energy literacy, but also leverages the added value of smart metering.

II. RELATED WORK

Based on the number of sensors used to gather device-level electricity consumption information, existing solutions for appliance load monitoring can be classified into two domains: multi-sensor systems and single-point sensor systems.

Multi-sensor approaches typically require a current sensor to be installed in-line with every device. To monitor the whole house, this device-level information is then aggregated at a central point. Commercially available solutions typically come in the form of smart power outlets. They measure the power consumption at the point where the load is caused and either visualize the data on a small display directly attached to the unit or propagate the consumption values wirelessly to a central display. A drawback of these systems is that they typically give a rather technical feedback and fail to integrate the consumption in a bigger picture that makes it more tangible for users. As mentioned above, such approaches typically require high monetary investment and high user effort to setup the feedback system.

Single sensor approaches are typically subsumed under the concept of Nonintrusive Appliance Load Monitoring (NALM). The initial work dates back to the 1980s, where Hart [3] tried first to match a-priori known appliance signatures in the overall power signal by using real and reactive power measurements at a rate of 1Hz. The concept proved to be effective in several field tests – at that time especially for larger loads – and paved ground for various other work based on this principle. Norford and Leeb, for example, introduced transient event detection at high sampling rates to disaggregate devices with similar power consumption [4], and follow-up work by Laughman et al. [5] explained how to use current harmonics to further disaggregate continuous variable loads. A variant of Hart's scheme deals with the separation of simultaneous on/off events of appliances [6].

Other work utilizes methods from artificial intelligence to disaggregate overall residential energy consumption data. Early approaches were typically bound to low-resolution data. Powers' [7] rule-based algorithm tries to analyze the energy consumption at a low sampling interval of 15 minutes. However, his approach is based on a large a-priori known reference database that requires monitoring of each appliance in the home for several days. Prudenzi disaggregated consumption data for large loads at the same sampling rate by using a neural network approach [8]. Ruzzelli et al. used a special purpose sensor that has to be installed at the circuit breaker. The consumption information is post-processed in an artificial neuronal network that requires a lengthy training process to disaggregate device level consumption [9]. Other rule-based work focuses on the possibility of differentiating between appliances with similar power consumption by taking into account their frequency of use [10] and using pattern recognition methods to disaggregate the overall electricity consumption into major energy end-uses [11].

More recent approaches deal with the analysis of data sampled at higher frequency. Statistical signature analysis has been used to infer the devices operating from the current and voltage waveforms [12]. Srinivasan combined harmonic signature analysis with neural networks and developed and tested several different classification models for signature extraction and device identification [13]. In contrast to these high frequency approaches that usually rely on special purpose sensors, Kolter et al. [14] recently investigated the possibility of load disaggregation using discriminative sparse coding based on hourly data.

Yet another idea has been explored in [15] and [16]. The authors combined two complementary approaches in a system that relies on a single sensor that can be plugged-in anywhere to the electric circuit. It then listens to detect unique noise changes and electromagnetic interference that occur through the switching of devices and through switch mode power supplies. The system can be used to infer about device operation which in combination with the data of an electricity meter can reveal the consumption of particular devices.

Summarizing the related work, existing systems can be characterized as follows: Multi-sensor approaches can rather easily achieve a consumption breakdown, but deploying a large number of sensors in the residential environment quickly leads not only to high cost but also to a discouraging high usage barrier [9]. In contrast, single sensor systems are easier to deploy but often rely on expensive custom hardware (e.g., for high sampling rates) and require either a priori knowledge about the household devices and their electrical characteristics, or they require a complex training phase involving the user where the system learns about the specific device characteristics. However, a-priori knowledge is difficult to obtain in a world of fast changing small appliances, and training procedures at the initial deployment are discouraging users and hinder adoption [10]. In addition, these approaches cannot take into account new devices that are introduced into the residential environment. Overall, we conclude that existing approaches fail to meet usability requirements that are essential for fast adoption.

III. SYSTEM OVERVIEW

Our system represents an integrated solution to identify the electricity consumption of household appliances from the data gathered by smart meters, which will be installed in large numbers in many countries over the next years. The approach builds on an earlier principle advocated by Hart [3]. It uses a single sensor and addresses remaining technical challenges (e.g., the recognition of smaller loads and overlapping on/off events of appliances) as well as some of the above-mentioned shortcomings with respect to usability. For this, we designed and developed a system that does not rely on custom hardware or complex training. In particular, we make use of a smartphone application, which much simplifies the appliance signature acquisition process because this is done as a side effect, invisible to users.

In the following, we first give an overview on the system architecture and its components. We then explain how residential appliances can be classified according to their characteristic electricity consumption.

A. Data Acquisition Architecture

One of the three main components of our system is an electricity meter that can measure the total electrical load of all attached devices in a household (Figure 1). The meter (we used model E750 by Landis + Gyr) logs the total consumption at a frequency of 1 sample per second. It has an integrated communication interface that is connected to a gateway, which is responsible for continuous data acquisition and storage from the electricity meter, and also for the handling of the incoming requests of the user interface. For that, the gateway consists of a web server (lighttpd, php), an SML parser, and a database (SQLite3). It is implemented on an embedded device based on a 600MHz CPU, 256MB storage of RAM and flash memory, and an Ethernet and WiFi-module for communication purposes. The third component of the system is the user interface that is implemented as a smartphone application. It provides users with real-time feedback on their electricity consumption. A detailed description of the design and the capabilities of the system can be found in [1, 2]. The communication between the three decoupled components is realized over http following the "Web of Things" paradigm [17]. This integrates physical resources, such as the meter and its measurements, seamlessly into the web. They can then be identified by URLs and accessed by the four basic HTTP commands through the RESTful-API provided by the gateway [2].

B. Classification of Residential Appliances

In the following, we explain how domestic appliances

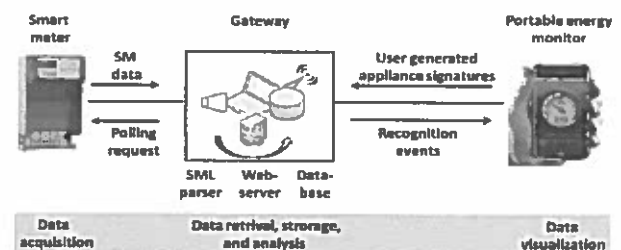


Figure 1. Loosely coupled data acquisition architecture.

can be classified according to their characteristic load signatures based on the physical quantities (i.e., apparent power, reactive power, real power, and distortion power) measured by the smart meter. Depending on its characteristic electrical and electronic components, an appliance can be of resistive, inductive, or capacitive nature. For example, a standard light bulb is purely resistive whereas a vacuum cleaner is predominantly inductive. In general, incandescent appliances (e.g., kettle, light bulb) are mostly resistive (ohmic), motors (e.g., fans, heaters) predominantly inductive, and devices containing a power supply or electronic frequency converters (e.g., laptops) mainly capacitive.

Figure 2 illustrates exemplary power signatures at a sampling frequency of 1 Hz for different appliance categories over different operation lengths. If the load is purely resistive, then the voltage and current are in phase (e.g., the iron (Figure 2 (left))). The reactive component Q of the apparent power is null, meaning all power is transferred to the load. A consumer with reactive components is either of type ohmic-inductive with a typical phase shift $0 < \varphi < \pi$ between current and voltage or ohmic-capacitive characterized by a negative phase shift $0 > \varphi > -\pi$ (Figure 2 (middle and right)). In addition, in electrical networks there may exist non-sinusoidal currents and voltages (e.g., caused by inverters in switching events) that result in harmonics. These harmonics cause an additional reactive component, the so-called distortion power (Figure 3). In mathematical terms this can be expressed as:

$$|S| = \sqrt{P^2 + Q_{trans}^2 + D^2},$$

where S is the apparent power, P is the real power, Q the translative component, and D the distortive component of the total reactive power.

Based on its internal composition and its possible modes of operation (e.g., static, multi-level, or variable) an appliance imposes a characteristic load profile on the electric circuit. This signature depends on the relation of the different power components and can be used to discriminate between appliances when disaggregating the total consumption. Our prototype system measures these parameters either directly or indirectly. In addition to these physical quantities, the signature length, peak voltage, and current are also important in terms of the appliance signature.

IV. THE APPLISENSE ALGORITHM

The AppliSense algorithm uses consumption data gathered by the smart electricity meter to automatically break down the total consumption to device-level. In the following, we first outline the basic idea and concept of our system that pays particular respect to usability. We then explain how the

signature database on which the algorithm crucially depends is acquired and discuss some algorithm details.

A. Basic Concept

The electricity consumption of a household fluctuates over time based on the operation of individual devices used by the residents (see Figure 4). For example, switching on a light induces the depicted change in the load curve. Having a more detailed look on the consumption data, the figure shows that there exist intervals where the load remains more or less constant on a stable level. A black bar marks two of these levels. The difference in real power (ΔP) between these levels indicates the change in electricity consumption due to the operation of the light. Our system not only measures the total load of the household, but the load characteristics (i.e., apparent power, real power, etc.) of each of the three phases separately. This phase-level data allows us to split up the overall electricity to get an even more detailed view.

These considerations lead to the following key concept of AppliSense, which can recognize device-switching events in the load curve based on an appliance signature database.

First, identify time points where significant changes between two levels of power consumption in the load curve occur. Second, once such an edge is detected, compute the differences of the different physical quantities between these consecutive levels and classify the change as a potential appliance-switching event. And third, compare each of these differences with a known set of differences from an appliance signature database and map the edge to an individual device according to its load characteristics.

Figure 5 illustrates these steps. It shows the electricity consumption (red) at a certain time interval in which five load levels (black bars) were identified. For simplicity, only the real power is visualized in this example. From this we

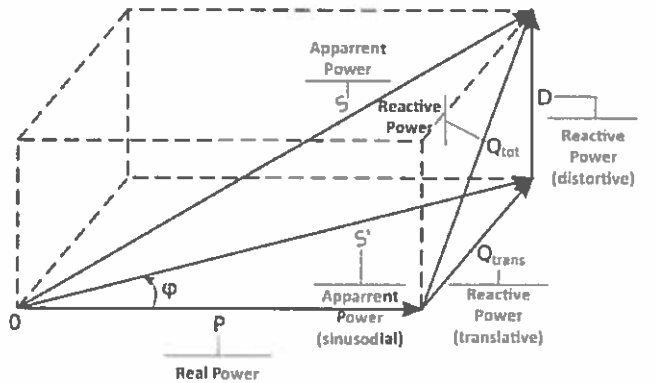


Figure 3. Relation between the different power quantities that can be derived with our prototype.

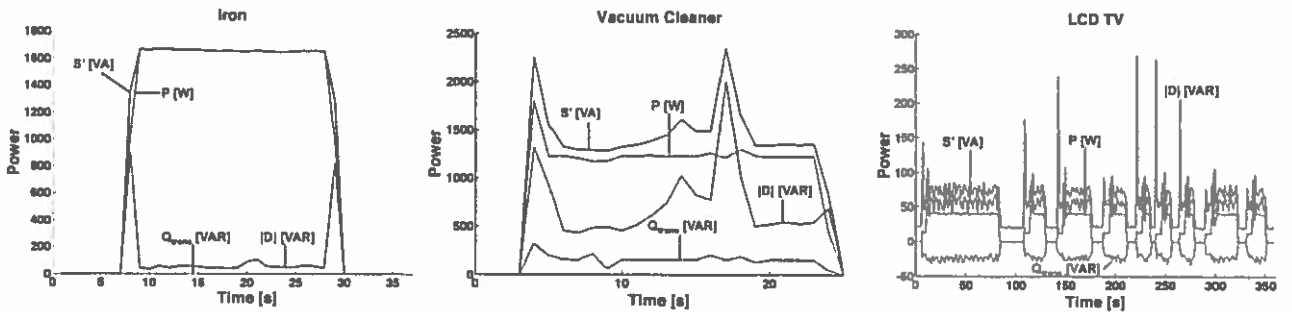


Figure 2. Power signatures of three different residential devices from different appliance categories and for different operation periods.

can compute four deltas: dP_1 , dP_2 , dP_3 , and dP_4 . Each of these deltas corresponds to a potential on/off event of a device. The algorithm tries to match these with a known device signature from the database. For that, each entry dP_i in a column of the matrix on the left symbolizes a delta which was extracted from the load curve at time i . The operator represents a detector logic that compares the rows of the matrix to the signature vector with the known deltas. The resulting vector holds the best matching entry, in case a matching appliance could be identified. In the example, this means that at time instant two and three matching signatures of a known device (a turning on and a turning off event) are detected. However, no signature is matching the events at time instants one and four.

B. User-friendly Signature Recording

In contrast to other load disaggregation systems, which often discourage users by requiring a long training period or complex calibration, we wanted to develop a system that is easy to use. This is particularly important for the generation of the signature database that is used to identify an appliance power signature. With our approach it is not necessary to take signatures of every appliance in advance, but the signature database is established with simple means over time. For that, we equipped the user interface of the smartphone with a measurement functionality that allows users to identify the consumption of an individual appliance in a simple, explorative way while at the same time logging the signature in the

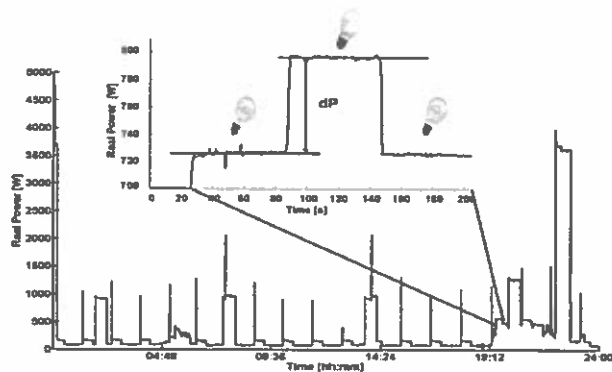


Figure 4. Key idea of the AppliSense algorithm.

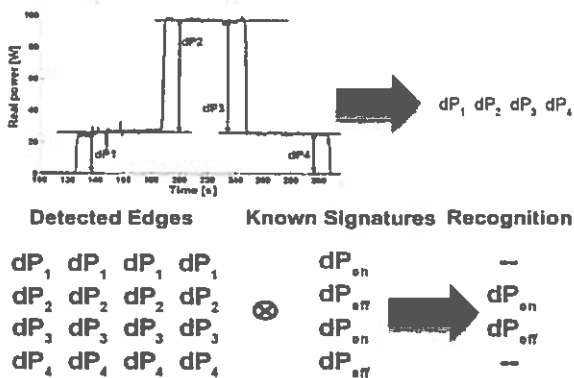


Figure 5. Simplified overview of the required steps to recognize an appliance in the overall electrical load.

background, invisible to the user. This also allows easily integrating new appliances that are introduced at home. Whereas other systems need to completely recalibrate, our approach is able to incrementally acquire signatures and thus integrate new devices, which is crucial in a fast changing home environment.

The measurement process is illustrated in Figure 6. To measure the consumption of a device, users initialize the measurement by pressing the start button on the user interface. They are then asked to turn the device being measured either on or off. Within a few seconds, the system then computes the result based on the measurement algorithm [18]. If desired, users can further personalize the measurement (e.g., picture, name, category, etc.) and store the device characteristics in the inventory of the mobile phone application.

During the measurement, the signature acquisition process runs in the background (see Figure 7; only real power depicted for clarity reasons). It logs the whole appliance signature (e.g., change in apparent, reactive, and distortion power, etc.). In addition, the algorithm automatically classifies whether an on ($dP > 0$) or off ($dP < 0$) switching event has occurred. AppliSense uses this information later as input knowledge. The idea of this approach is to systematically increase the number of signatures in the database while the system is being used. This leads to higher precision in recognizable operation events over time.

C. Algorithm Design

The AppliSense load disaggregation algorithm consists of six steps that are subsequently discussed in this section (Figure 8). It follows the early principles discovered by Hart, but much simplifies the signature acquisition process for users.

(1) *Normalization and (2) Edge Detection*: In power circuits, load-dependent voltage drops can occur (e.g., in reaction to a switching event of an appliance). From $I = U/R$ and $S = U \times I$ for apparent power S and effective values of voltage U and current I , a quadratic relation arises: $S = U^2/R$.

Hence, voltage drops can lead to large differences in power consumption, which we have to account for by normalizing the power values to a constant voltage (of 230 V):

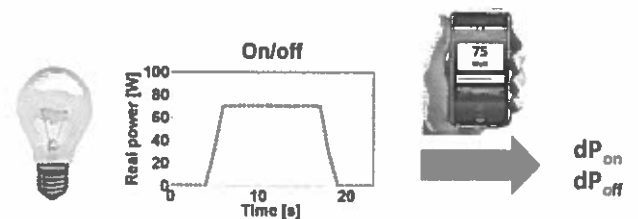


Figure 7. User-friendly signature acquisition process with the help of the measurement feature of the user interface.



Figure 6. User process to measure the power consumption of an individual appliance (e.g., an office flood light).

$$S'_n = \left(\frac{230}{U}\right)^2 \times S.$$

In order to identify edges in the recorded electricity consumption data that correspond to switching events of appliances, we use the normalized apparent power S'_n as input vector. The algorithm computes the absolute values of the differences between two consecutive values of normalized apparent power S'_n in the data series. If the absolute value of such a difference is larger than a predefined threshold f_{th} , then the value potentially belongs to an edge. However, there can be much more potential edges than appliance-switching events. The threshold f_{th} has to be robust to small changes due to noise on the electric line.

The leftmost plot in Figure 9 depicts the apparent power of a Nintendo Wii usage cycle over a time span of 180 seconds. The two distinctive edges are related to switching the game console on (at time step 22) and off (at time step 106). The figure also shows the relatively strong fluctuations in apparent power during the start phase of the device compared to the ones in standby (from 0s to 22s). The middle histogram of the figure depicts the difference of two subsequent apparent power values over the same time frame. We find larger changes in apparent power when turning the application on/off compared to times of operation or standby. We experimented with different thresholds and generally achieved best results applying a filter with a threshold f_{th} of 2VA. It removes a large number of intervals that do not correspond to a switching event (Figure 9 right). However, due to the transient behavior of the particular appliance, there persist some peaks (e.g., between 24 to 45 seconds) in the graph although no switching event occurred. In general, such oscillations during operation can be even stronger and more frequent which would result in a high number of spurious events. Applying a smoothing filter can help remove these false detections. However, it also bears the risk of cancelling out edges (typically small ones) that correspond to real switching events. Consequently, these switching events would not be identified and the operation would be missed.

In order to decrease the number of spurious events, we investigated different smoothing filters. We tested a median filter, a mean filter, a kernel-weighted average filter (Nadaraya-Watson filter with Gaussian kernel), and different combinations of these on the apparent power signal. An advantage of a median filter is the ability to remove outliers. However, periodic curves (e.g., sine, triangle, saw tooth, square, etc.) could be resistive. On the other hand, a mean filter, which computes equally weighted averages of a sliding

window of values, has the ability to smoothen periodic oscillations, but may not always remove large outliers. Even worse, it might erase edges which correspond to an actual on/off switching of a device. A kernel-weighted average filter adds more complexity. We experimented with several kernel functions and observed best results when applying a Gaussian kernel [19]. It allows preserving edges while attenuating oscillations of the original signal. The extent to which the filter smoothenes the signal is determined by the kernel bandwidth, which relates to the window size.

In order to evaluate the influence of the filters on the edge detection and to find the most appropriate combination of filtering, we simulated a typical household usage scenario over 30 minutes in a controlled lab environment. During that period appliances of different characteristics were used and 12 appliance switching events occurred. Table 1 shows the results when applying the different filters to the signal. The number in brackets corresponds to the window size/kernel bandwidth of the respective smoothing filter. The table displays the number of changes of apparent power values larger than 2VA, the achieved reduction gain compared to the original signal, and the number of missed true appliance on/off events. Overall, the original signal contained 709 changes in apparent power with a delta larger than 2VA.

Using a median filter or a mean filter alone reduces the number of potential edges by 74% and 70% respectively without missing a true device-switching event. A combination of mean and median filter achieves slightly better results (76%) at no extra cost in terms of computation complexity. The reason for this relatively small improvement is due to the fact that the possibility to remove outliers is constrained by the small window size. This filter parameter determines the extent to which the original signal is smoothened. However, increasing the value decreases the lower limit of loads that can be detected by AppliSense. The parameter of 5 was chosen as a trade off that enables filtering without precluding the recognition of smaller loads.

The performance of kernel smoothening strongly depends on the bandwidth of the kernel. The potential reduction varies between 35% and 94% depending on the kernel bandwidth. Adding a kernel filter to the smoothening median/mean strategy leads to higher reduction in potential edges (3% – 17%). From a bandwidth parameter of 60 on, we observe that the smoothening starts canceling out true switching events. Independent of the bandwidth, however, this approach increases the computational complexity significantly.

Overall, we achieved best results using a kernel filter. However, this comes at high computational cost due to the quadratic complexity of the filter. Hence, we decided to go for a more efficient solution that performs close to optimum. It combines a median filter that removes outliers with a mean filter that further smoothenes the signal (see line 5 of Table 1). The result of this smoothening strategy is illustrated in Figure 10. In our evaluation scenario, we used a notebook, several different lights, and a kettle to obtain the original power signal (red). The blue markers correspond to the 709 points in time where the absolute difference of two subsequent apparent power values is greater than 2VA. Applying a median filter of five followed by a mean filter of the same size results in the green markers. The reduction gain (75.5%) of the

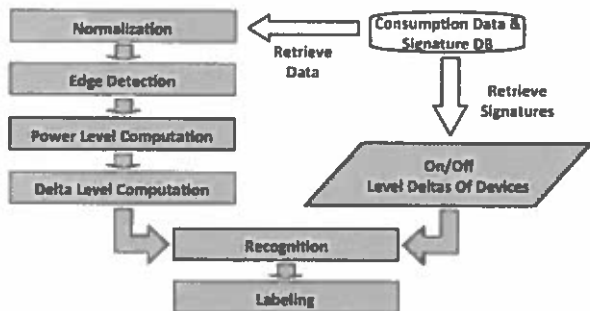


Figure 8. Overview of the six steps of the AppliSense algorithm.

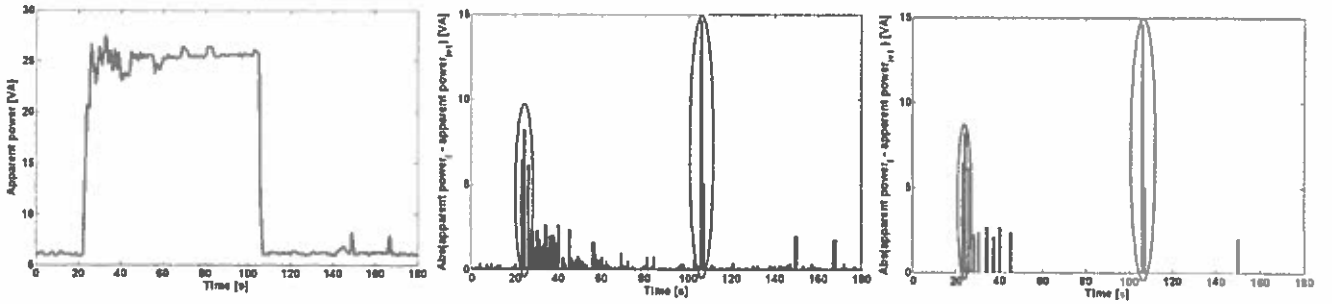


Figure 9. Apparent power for a duty cycle of a Nintendo Wii (left). Resulting absolute differences in apparent power (middle) and with a filter of 2 VA (right).

filter can be seen by comparing the blue with the green markers. The edge detection interprets the remaining 174 green markers as a binary vector which indicates at position i that the smoothed estimate of the apparent power at time step i differs by more than 2VA from the value at position $i-1$. Hence, the measurement at time i belongs to a potential device-switching event.

TABLE I. COMPARISON OF DIFFERENT SMOOTHENING FILTERS

Filtering Method	$\Delta S > 2VA$	Reduction	Missed
Median(5)	185	73.9%	0
Mean(5)	218	69.2%	0
Kernel(3)	459	35.3%	0
Kernel(100)	46	93.5%	0
Median(5), Mean(5)	174	75.5%	0
Median(5), Mean(5), Kernel(3)	151	78.7%	0
Median(5), Mean(5), Kernel(60)	78	89%	1
Median(5), Mean(5), Kernel(70)	52	92.7%	4

(3) Power Level and (4) Delta Level Computation: Having identified the relevant edges, the next step extracts power levels that connect two edges in the smoothened signal. From two consecutive power levels separated by an edge, the algorithm then extracts the delta vectors that are used for matching the edge to a particular device.

Each power level consists of a start and an end time, a vector with component-wise means of real, reactive, and distortion power for the first five measurements at the start and the last five measurements at the end of the interval (start mean (sm) vector and end mean (em) vector), and a three-by-five matrix which holds the original real, reactive, and distortion power values. The component-wise standard deviation of all power values is also calculated.

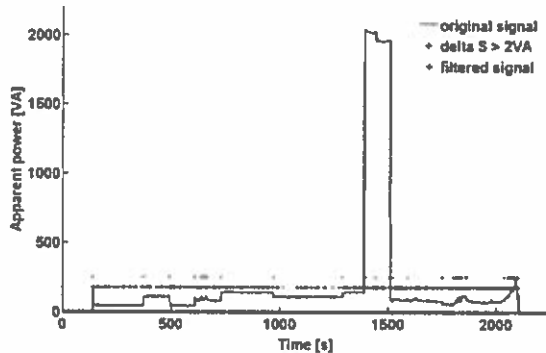


Figure 10. Application of mean/median filter to the original power signal.

From two consecutive power levels, the algorithm computes the difference vector for real, reactive, and distortion power. To take oscillations during start up and shut down of an appliance (e.g., due to heating up at the start of a kettle) into account, we not only calculate one difference vector for level i to $i+1$ (e.g., end of level i (em_i) – start of level $i+1$ (sm_{i+1})), but four difference vectors d_{ij} that include the start and the end values of both levels:

$$\begin{aligned} \vec{d}_{s,i,s,i+1} &= \vec{sm}_i - \vec{sm}_{i+1}, \\ \vec{d}_{s,i,e,i+1} &= \vec{sm}_i - \vec{em}_{i+1}, \\ \vec{d}_{e,i,s,i+1} &= \vec{em}_i - \vec{sm}_{i+1}, \text{ and} \\ \vec{d}_{e,i,e,i+1} &= \vec{em}_i - \vec{em}_{i+1}. \end{aligned}$$

For each edge, we add these four vectors to a result matrix used as input for matching the device signatures in the next step.

(5) Recognition and (6) Labeling: The recognition part of the algorithm tries to match known appliance signatures \vec{k}_j from the signature database with extracted delta vectors \vec{d}_i obtained as a result in the previous step. In order to identify an appliance on/off event, we perform a nearest neighbor search in the two-dimensional dQ/dP space (see Figure 11).

First, the algorithm computes for every \vec{d}_i its Euclidean distance to every \vec{k}_j in the two-dimensional vector space. If this is smaller than a predefined value (r) of the length of \vec{k}_j , plus an oscillation value (osc), a potential matching is identified:

$$\|\vec{d}_i - \vec{k}_j\| < r \cdot \|\vec{k}_j\| + osc \begin{cases} \text{if true, } \vec{k}_j \text{ is a potential match for } \vec{d}_i \\ \text{if false, } \vec{k}_j \text{ is not a match for } \vec{d}_i \end{cases}$$

The oscillation term (osc) is the length of a vector which consists of the maximum of the standard deviation in the real power at level i or $i+1$ as first component, and of the maximum of the standard deviation in reactive power at level i or $i+1$ as second component:

$$osc = \begin{pmatrix} \max(\text{std}(P \text{ at level } i), \text{std}(P \text{ at level } i+1)) \\ \max(\text{std}(Q \text{ at level } i), \text{std}(Q \text{ at level } i+1)) \end{pmatrix}$$

After this, every \vec{d}_i contains a set of associated possible recognition candidates \vec{k}_j from the signature database. Note that this set of possible associated recognitions could also be empty. In such a case, the corresponding \vec{d}_i could not be related to a known signature. This could be caused for example by a detected edge which does not correspond to an appliance switching event, or by the non-existence of a corre-

sponding signature in the database that matches \bar{d}_i . Second, for each \bar{k}_j , a nearest neighbor match is performed over all potentially matching candidates \bar{d}_i that have been associated with \bar{k}_j . Finally, the algorithm labels the load profile with the corresponding device names.

V. ALGORITHM EVALUATION AND LIMITATIONS

In order to analyze the performance of the AppliSense algorithm, we installed the whole system in a laboratory environment. For the evaluation, we used a controlled set of appliances which typically occur in a student's household. Table II provides an overview of the appliances, their real power consumption stated on the manufacturer label, their verified real power range in operation (measured by a separate power monitor), the appliance category (O for ohmic, I for ohmic-inductive, and C for ohmic-capacitive), and the real power that is obtained as part of the power signature using our smartphone application. All devices were connected to the same phase over the whole evaluation. Some of the appliances have power consumptions within the same range. However, if belonging to different categories, we should still be able to differentiate the corresponding events.

TABLE II. APPLIANCES USED FOR ALGORITHM EVALUATION

Appliance	Labeled Power	Power Range	Category	Consumption
Light bulb	75W	70W	O	70W
Kettle	2200W	1855 – 1933W	O	1900W
Heater	2000W	1619 – 1667W	O	1635W
CD player	13W	9 – 13W	I	3W
Fan	50W	45W	I	45W
Notebook	72W	30 – 35W	C	35W
Fluorescent lamp	35W	21 – 28W	C	25W
Wii	52W	10 – 45W	C	15W

During times when only a single appliance was active, the algorithm identified the on/off events of all devices except the CD player correctly. Every device was turned on and off at least three times. The edges caused by the CD player were not recognized neither when being turned on nor when being turned off. This can be explained through the limitations introduced by the filtering. Using a window size of 5 samples in our test scenario leads to a lower boundary of 10VA for edges that can be recognized. The CD player has a relatively high standby consumption of 6W compared to its 3 – 7W in operation. While the median filter does not influence the signal, the constant 3W during operation result in a

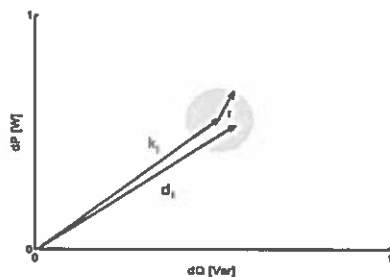


Figure 11. Device recognition: Comparing a detected power edge to a known signature in the Euclidian dQ/dP space.

step-wise increase of 0.6VA after the application of the mean filter. This increase is too small ($\ll 2VA$) to be detected as an event using the chosen median/mean filter.

Next, we combined the use of multiple devices in a random order. Although the CD player cannot be recognized, we operated it and other devices with unknown signatures from time to time to vary the base line consumption and to have more appliances concurrently running. Over a time span of several hours, we documented 80 switching events of which 77 were identified correctly.

Figure 12 shows a sample labeling output of the algorithm (for a simulated office environment). After the notebook has been turned on, different devices were concurrently used and a kettle was operated. However, the red circle highlights a moment at which the office lamp is turned on but the event is not detected. This is due to the oscillations caused by a device that was operating at the same time. A second problem (not depicted) occurred when operating the notebook. Due to the different battery levels, the power consumption had varied compared to the one registered in the appliance signature database. This led to the correct identification of the edge, but no appliance signature could be matched to the detected event.

These two examples outline limitations of the current implementation. Oscillations caused by operating devices can mask the consumption, especially of low power drawing appliances. This could in particular be a problem in larger households (e.g., family houses) with lots of appliances and activity. In addition, the algorithm cannot detect devices that do not have well-defined operation states but have a continuously changing consumption. This is due to the initial assumptions regarding the algorithm design and the tradeoff for relying on a single sensor system with a 1Hz sampling frequency. In the conducted laboratory study we observed that the appliance signatures recorded with the smartphone application were very reliable. That is, the delta vectors obtained with the measurement function when turning an appliance on/off are stable and reproducible over time. However, this may be different in a more dynamic home environment – there the algorithm may need several (slightly different) signatures per device to reliably recognize appliances.

Overall, the evaluation shows promising results. We generated 144 device-switching events in our test scenario. 16 of these came from devices with a consumption so small that

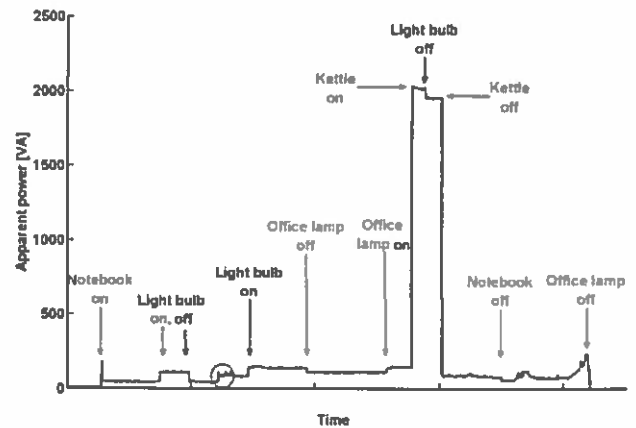


Figure 12. Labeled load curve as output of the AppliSense algorithm.

the filter canceled out the corresponding edges. When subtracting these events, the algorithm identified 125 out of the remaining 128 events correctly, which results in an overall recognition rate of about 90%. In practice this enables interesting applications, such as automated recommendations for a more economic use of electricity in households.

VI. CONCLUSIONS AND FUTURE WORK

We gave a detailed description and evaluation of a system that facilitates automatic recognition of switching events of electric appliances. In contrast to other existing approaches, our objective was to develop a system that achieves this by being unobtrusively integrated in users' life and without requiring a complex system setup or training. We achieved this by interconnecting components that are becoming ubiquitous in home environments: a smart meter and a smartphone. The signature database is established over time and also allows introducing new devices, which is important in a fast changing home environment. In particular, we achieve this as a side effect of a smartphone application, which much simplifies the appliance signature acquisition for users.

Applying data analytics to the gathered metering data allows the system to raise energy awareness by providing better-tailored energy feedback without the need for special purposed hardware. In combination with actuation capabilities, we can foresee this information to be used to automatically optimize energy consumption and hence increase residential energy efficiency. Not least, appliance-level consumption information can give rise to new business models (e.g., providing cross-selling offers for non-energy-efficient devices). With a recognition rate of about 90% the results of our evaluation study confirm the suitability of the general scheme and encourage us to intensify further research.

Future work consists of deploying the system in various households to gather real-world data that allows for more in-depth evaluation of AppliSense. Based on these experiences, we plan to analyze the algorithm's dependency on the number of manually recorded signatures and to implement relevant refinements. This also includes accuracy improvements through the extension from one to three phases (which helps in case two appliances are turned on/off at the same time) and a module for auto-identification of hard-wired heating and cooling devices. In order to deal with edges detected in the load curve that do not yet correspond to an existing signature in the database, we focus on the application of clustering concepts that automatically classify these events (and once a certain probability is reached, verify the match by pushing a notification to the user interface). We also envision the possibility to upload appliance signatures to a community platform [18]. In the long term, we would like to investigate the possibility of building a larger appliance signature base. In addition, we are considering methods to derive occupancy state from electricity and appliance use data, in order to use this information in a smart heating control strategy [20].

ACKNOWLEDGEMENTS

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Bentonville Police Use Smart Water Meters As Evidence In Murder Investigation

POSTED 6:51 PM, DECEMBER 28, 2016, BY KATHRYN GILKER. UPDATED AT 08:46AM, DECEMBER 29, 2016



BENTONVILLE (KFSM) -- A local murder case is making national headlines this week after privacy advocates expressed concern over a search warrant filed for data that may have been captured by Amazon's Echo speaker in the suspect's house.

Bentonville investigators said they believe any data collected by the Echo may be evidence in the case, but that is not the only so-called "smart device" police are looking at in this case. Investigators have also pulled data from the suspect's smart water meter.

Court documents show investigators believe James Bates cleaned up the murder scene because of the amount of water he used in a two-hour window. Police said they got that data from the smart water meter at his home, which, according to the city utilities department, takes a measurement every hour of how much water is used.

5NEWS spoke with Heath Ward, the executive director of Springdale Water Utilities, which uses meters similar to those used in Bentonville. Ward said Springdale's meters can read data continuously or do a spot reading and then send back that information to a central server.

"If a customer has a problem, a specific problem, and suspect they have a leak, we do have more technology that actually monitors and takes a reading 24 hours a day for 30 days and you can see the habits, the water habits of the house," he explained.

Ward said there is always a possibility the time readings on the meters could be inaccurate, but doesn't think it's likely.

"It's one out of tens of thousands of chances," he said. "This technology is very reliable. The odds of you having a mechanical failure on a meter are much higher than the electronic portion failing."

But Bates' attorney Kimberly Weber said experts have found smart meters to be very unreliable in this case.

"When it comes to the timeline we've created that we've used our experts, scientific, water aquatics experts, we've used hydro-geologists to show that the timeline is incorrect," she said.

Weber said right now police only have data from a water meter and other devices, but don't have any DNA evidence or a motive.

"We will be able to prove that there is a 12-hour difference in the water usage that they put out in the affidavit of probable cause and the uses of my client using the water to fill up the hot tub the day before," she said.

Bates next court hearing is in March and a trial date has not been set.



MICHIGAN LEGISLATURE

Michigan Compiled Laws Complete Through PA 24 of 2016

[Home](#) [Register](#) [Why Register?](#) [Login](#) [New!](#) [Help](#)

NAVIGATE SECTIONS

MCL Chapter Index

Chapter 750

Act 328 of 1931

328-1931-LXXXII

Section 750.539d

Legislature

Bills

Appropriation Bills

Calendars

Committees

Committee Bill Records

Committee Meetings

Concurrent Resolutions

Initiatives/Alternative

Measures

Joint Resolutions

Journals

Legislators

Public Act (Signed Bills)

Resolutions

Rules

Session Schedules

Search - Basic

Search - Advanced

Laws

Often Req Laws

Req Outdated Acts

Basic MCL Search

Advanced MCL Search

Public Act MCL Search

Michigan Constitution

Chapter Index

Executive Orders

Executive Reorgs

Historical Documents

MCL Tables

More

Archives

Section 750.539d

[friendly link](#) [Printer Friendly](#)

THE MICHIGAN PENAL CODE (EXCERPT)

Act 328 of 1931

750.539d Installation, placement, or use of device for observing, recording, transmitting, photographing or eavesdropping in private place.

Sec. 539d.

(1) Except as otherwise provided in this section, a person shall not do either of the following:

(a) Install, place, or use in any private place, without the consent of the person or persons entitled to privacy in that place, any device for observing, recording, transmitting, photographing, or eavesdropping upon the sounds or events in that place.

(b) Distribute, disseminate, or transmit for access by any other person a recording, photograph, or visual image the person knows or has reason to know was obtained in violation of this section.

(2) This section does not prohibit security monitoring in a residence if conducted by or at the direction of the owner or principal occupant of that residence unless conducted for a lewd or lascivious purpose.

(3) A person who violates or attempts to violate this section is guilty of a crime as follows:

(a) For a violation or attempted violation of subsection (1)(a):

(i) Except as provided in subparagraph (ii), the person is guilty of a felony punishable by imprisonment for not more than 2 years or a fine of not more than \$2,000.00, or both.

(ii) If the person was previously convicted of violating or attempting to violate this section, the person is guilty of a felony punishable by imprisonment for not more than 5 years or a fine of not more than \$5,000.00, or both.

(b) For a violation or attempted violation of subsection (1)(b), the person is guilty of a felony punishable by imprisonment for not more than 5 years or a fine of not more than \$5,000.00, or both.

DTE Electric Company
One Energy Plaza, 688 WCB
Detroit, MI 48226-1279

DTE Energy



Michael J. Solo, Jr.
(313) 235-9512
solom@dteenergy.com

September 14, 2015

Ms. Mary Jo Kunkle
Executive Secretary
Michigan Public Service Commission
7109 West Saginaw Highway
Lansing, Michigan 48917

Re: In the matter on the Commission's own motion requiring DTE Electric Company to file a report regarding strategies for education, outreach, marketing and customer support of time of use rates and dynamic peak pricing.
MPSC Case No. U-17936

Dear Ms. Kunkle:

Attached for electronic filing in the above-captioned matter is DTE Electric Company's Report Describing Strategies for Education, Outreach, Marketing, and Customer Support of TOU Rates and Other Pricing Options.

Very truly yours,

Michael J.
Solo, Jr.

Michael J. Solo, Jr.

Digitally signed by Michael J. Solo, Jr.
DN: cn=Michael J. Solo, Jr., o=DTE Energy,
ou=General Counsel-Regulatory,
email=solom@dteenergy.com, c=US
Date: 2015.09.14 14:14:56 -0400

MJS/lah
Attachment

**DTE Electric Company's Report Describing Strategies for
Education, Outreach, Marketing, and Customer Support of
TOU Rates and Other Pricing Options**

September 14, 2015

MPSC Case No. U-17936

Introduction

On June 15, 2015 the Commission issued an Order in Case No. U-17689 that required DTE Electric Company ("DTE") to file a report describing the company's strategies for education, outreach, marketing, and customer support of time-of-use (TOU) rates and other pricing options that are, or will be, available to DTE Electric customers. The Commission also required that DTE include information on how it intends to integrate AMI with programs and technologies. (MPSC Order U-17689 P/37)

DTE has a goal to provide excellent service and be a force for growth and prosperity in the communities where we live and serve. We know that many factors affect customer satisfaction and we continually look for opportunities to improve our programs and exceed customer expectations. One way we strive to do that is by providing pricing options and leveraging new technology to increase customer engagement. This report will provide information regarding our new Demand Side Management group, current TOU and pricing options; discuss experience gained from our recent TOU and Behavioral Demand Response (BDR) pilots, introduce a new program called DTE Insight; and outline our future plans to further engage and educate our customers in understanding and controlling their energy bills through use of various marketing programs.

Demand Side Management Organization

In August of 2014, DTE made a commitment to further develop Demand Response (DR) resources by forming a Demand Side Management (DSM) organization. This working group of dedicated full time employees focuses on demand side alternatives such as demand response, distributed customer generation, and peak demand reduction.

Supported by the Business Planning and Development organization, the group is able to interact with the generation strategy and integrated resource planning teams to determine when demand side resources are viable alternatives within the DTE long term plan. They are also responsible for tactical deployment and program management of the existing DR resources and TOU rates that DTE has such as Interruptible Air Conditioning (IAC), Dynamic Peak Pricing, and the Company's Behavior Demand Response pilot which are discussed in more detail below.

DSM group members have actively been involved in benchmarking activity with other utilities and industry groups, including but not limited to: Peak Load Management Alliance, Association for Demand Response and Smart Grid (Board of Directors), Smart Grid Consumer Collaborative, and the DOE Smart Grid Investment Grant Consumer Behavior Study utility working group. DSM members utilize these peer relationships with other utilities not only for best practices but also lessons learned.

At this time, DTE believes there is potential to increase DR resources (potentially up to 100 MW) to our existing IAC portfolio in the next five years with the existing programs. The Demand Side Management organization is currently evaluating the market dynamics and the correct technology to determine and implement a plan to meet this potential.

Background on Time-of-Use Rates

TOU rates are not a new concept. Electric utilities have experimented with pilot programs for years. With the recent advances in metering technology, electric utilities are seizing the opportunity to expand their time-varying rates for the mass market. The potential benefit of this new technology is the ability to provide creative pricing schemes to retail electricity customers. Advanced meters can record and digitally communicate electricity consumption data on frequent intervals (e.g., 15 minutes or hourly), thereby allowing for the provision of time-varying rates. Real time usage data from these meters combined with web-based communications and controls are allowing these TOU rate plans to realize their full potential. According to a customer behavior study analysis conducted by the Lawrence Berkeley National Laboratory¹ financial benefits is the driving motivator for customers enrolling in TOU rates.

Time-varying rates can be designed in a number of ways and the most common categories are TOU, Critical Peak Pricing, Critical Peak Rebates, and Real Time Pricing.

Time-of-Use (TOU): A static TOU rate breaks up the day into time periods and provides a schedule of rates for each period. For example, a peak period might be defined as the time from 2 pm to 6 pm on weekdays, with the remaining hours being Off-Peak. The price would be higher during the peak period and lower during the Off-Peak, mirroring the average. Additionally, the peak and Off-Peak prices might vary by season. With a TOU rate, there is certainty as to what the prices will be and when they will occur. This simple method of pricing encourages customers to reduce their electricity use during peak demand times by charging a higher price and shifting use to times of lower demand by offering a lower price during these periods.

Critical Peak Pricing (CPP): With this type of pricing, participating customers face higher prices during the few days when Critical Peak “events” are called, and may be tied to when wholesale prices are the highest or when the power grid is severely stressed (i.e., during a heat wave). The customer can avoid paying high prices by reducing electricity use during these periods of high demand (which may only occur up to a pre-determined number of times per year) and benefit from a slightly lower price for non-event hours relative to the flat rate. This pricing provides a strong incentive for customers to reduce consumption during peak hours of critical event days. This higher Critical Peak price can be in excess of \$1 per kWh. In return, the participants receive a discount on the standard tariff price during the other hours of the day or season to keep the utility’s total

¹ King, Chris. “Why Few U.S. Consumers Use Time-of-use Energy Prices, and How Utilities Can Correct That.” *Siemens*. N.p., 13 Sept. 2012. Web. 23 July 2015.

annual revenue constant. Customers are typically notified of an upcoming “Critical Peak event” one day in advance.

Critical Peak Rebate (CPR): With CPR, the utility pays the customer for each kilowatt hour of electricity they are able to reduce during the peak hours of critical event days relative to the amount they normally use (known as “baseline amounts”). Similar to CPP, this pricing incentivizes reductions in consumption only during critical events. In contrast to CPP, customers do not face a risk of increased bills if they are unable to reduce consumption at that particular time; however, the utility faces the challenge of defining the baseline amounts and risks over-compensating the customer if the baseline is not appropriately estimated. If customers do not wish to participate, they simply pay the existing rate.

Real Time Pricing (RTP): Participants in RTP programs pay for energy at a rate that is linked to the hourly market price for electricity. Depending on customer class, participants are made aware of hourly prices on either a day-ahead or hour-ahead basis. Historically, this type of pricing has been used for larger commercial and industrial customers, who are likely to have access to technologies to control loads when prices rise above a certain limit.

DTE’s Time-of-Use Rates

DTE currently offers two “whole house” time-varying rates that are available to its customers: Time-of-Day (D1.2) and Experimental Dynamic Peak Pricing (D1.8). D1.2 is designed like a static TOU rate as defined above while D1.8 mirrors a Critical Peak Pricing component. Both rates encourage customers to reduce or shift their demand during peak periods to less expensive times of the day. These rates currently carry customer enrollment limits but are not fully subscribed.

Time-of-Day D1.2	Experimental Dynamic Peak Pricing D1.8
<ul style="list-style-type: none">• Enrollment Limit - 10,000• Enrolled (approx.) - 1,950	<ul style="list-style-type: none">• Enrollment Limit - 5,000• Enrolled (approx.) - 1,500

Although both rates have varying time-of-day charges, D1.2 also is designed with a different seasonal On-Peak/Off-Peak charge during the summer (June – October) and winter (November – May). A summary of the rates is shown below:

Time-of-Day – D1.2*		Experimental Dynamic Peak Pricing – D1.8*	
Service Charge	\$19.00/month	Service Charge	\$6.00/month
Power Supply Charge		Power Supply Charge	
June-October (On-Peak)	13.39¢/kWh	On-Peak 3pm – 7pm (M-F)	12.648¢/kWh
June-October (Off-Peak)	4.283¢/kWh	Mid-Peak 7am – 3pm (M-F) & 7pm – 11pm	7.378¢/kWh
November-May (On-Peak)	11.263¢/kWh	Off-Peak 11pm – 7am (M-F) and all day Sat., Sun, and designated holidays	4.216¢/kWh
November-May (Off-Peak)	4.11¢/kWh	Critical Peak events	\$1.00/kWh
Deliver Charge	6.837¢/kWh	Deliver Charge	5.497¢/kWh

* Plus applicable surcharges

Note: The current \$19 per month service charge under the D1.2 rate is seen as a barrier to enrolling additional customers. Customers begin saving on D1.2 compared to the D1 Residential Rate when they use more than 1,400 kWh per month. Case No. U-17767 filed on December 19, 2014 is proposing to equalize the service charges between the rates in order to make this rate more attractive to customers. In addition, the Company has proposed to remove the cap on customer enrollment on the D1.8 rate and reduce the Critical Peak event price to \$0.95/kWh to increase its marketability.

Customer Benefits of TOU Rates

Customers will see the greatest benefit and save money when they shift as much of their electricity use to the “Off-Peak” times as they can. TOU plans charge higher rates for usage during peak demand times and lower rates when demand is low. Saving opportunities present themselves when customers change their behavior and begin running discretionary loads, like dishwashing, at night or saving up laundry for weekends. Other useful strategies involve using web-enabled thermostats or smart thermostats to reduce peak space conditioning load. Typically, customers who can use more than two-thirds of their use “Off-Peak” will save on their energy bills. As can be seen from the graphs below, each DTE “whole house” TOU rates differ slightly for the On-Peak and Off-Peak periods.

To Whom It May Concern,

The passage of the Analog Meter Choice Bill, HB 4220, is very important to me. This bill would provide that any utility customer who wishes to have an analog meter on their home, rather than a smart meter or digital meter, can have one. The analog meter is the old-style, "clock-dial" meter. I believe that every customer should have a choice. Here are some of my areas of concern regarding the smart meter technology starting with my number one issue:

Privacy/Freedom: The smart meters can record detailed information about electricity usage. It is possible for them to determine which appliances are running and when and for how long. DTE continuously tells me that this is so they can tell me when I'm using the most electricity so I can then reduce my use. I believe that they do not need to know when I do my laundry or how many hours my television is on. I am fully aware of that as I am the person using these utilities! With this technology, I see a future where the utility companies can use this information to restrict my usage or otherwise intrude upon my family's activities.

Bill Increases: The meters will be used to institute peak pricing, forcing customers to pay more for electricity at certain times of the day. Seniors, home business, etc. will have no option but to pay increased rates that many cannot afford. While currently optional, once all the meters are installed, peak pricing will become a mandatory program.

Ironic Truth - Costs: The analog meter is the cheaper option for the utilities. It costs them nothing to leave it on a person's home. It costs them less than \$15 on the market. A smart meter costs from \$250 to \$450 per meter. To install an "opt out" meter (a smart meter which still contains a switch mode power supply - see below - but the transmitter is supposedly switched off), DTE wants to charge an initial fee of \$67.20 and then charge \$9.80 per month to supposedly cover payment of meter readers. It is outrageous to me that I would be forced to pay such an expense when I would happily take a monthly picture of my meter and send it to them. As a side note, the scare tactics DTE uses to make their PAYING CUSTOMERS give in to their demands are appalling.

Health: While I personally have not experienced physical problems from exposure to wi-fi and cell phones, I have great sympathy for those who do. I have felt something akin to their problems when I attempted to use a power adapter which plugs into the car convenience port (cigarette lighter) to power a 120v 3-pronged device such as a computer. We began to use this adapter, and within minutes everyone in the car within 3-4 feet of the adapter began to feel the disorienting effects of the dirty electricity it emitted. Although surprised by this unexpected event, my husband, an electrical engineer, experienced the effects as well and explained that this device uses a switch mode power supply just like the smart meters being forced upon our communities.

Please help me to fight for the freedom to choose a healthier and more inexpensive way to measure my utility usage!

Cheryl MacKinnon

Macomb Township, MI resident



March 7, 2017

House Energy Policy Committee
Lansing, Michigan

Re: HB 4220 - Regulation of smart meters

Dear Representatives,

The Michigan Environmental Council is a coalition of environmental, conservation and faith-based organization located across Michigan. We are active in policy discussions regarding energy issues and are one of the organizations involved in residential ratepayer protection work within the state.

As information services have become more advanced, it is important for our energy providers to also upgrade meter technology within homes and businesses they serve. It cost energy providers significantly more money to provide electricity on a hot summer afternoon than it does on a mild spring evening. Eventually, that difference in cost should be reflected in the rates we pay.

We recognize that some customers have reservation about the transmitting capabilities of their meters. We believe those customers should have the option to disable the transmitters and pay the actual costs of having their meters manually read.

However, the meters also have the ability to reduce energy costs for Michigan ratepayers. The cost of purchasing and installation of the meters exceeded \$1.5 billion. At the time the MPSC approved them, ratepayers were promised by utilities that we would receive over \$900 million in cost savings through greater energy efficiency and reductions in peak demand. Those savings will only be realized if the new meters are coupled with better rate designs which encourage customers to avoid using electricity during peak demand times. Experts predict that Michigan utilities could avoid building 1-2 new power plants (at a cost of \$1-\$2 billion) if they implemented rates which better reflected the true cost of providing electricity.

We do not support the bill as introduced, and think the bill needs to address the following concerns:

- 1) Access to information – Customers must have access to their data and the ability to have third parties access that data.
- 2) Opt-out fees – fees should cover the cost of at least one annual reading of the meter, and be more if residents are not willing to send meter information by other method.
- 3) It should be clear that only a property owner has the right to require manual reading of the meter.

We remain committed to working with the bill's sponsors and co-sponsors to address these concerns and protect the rights of all energy customers of Michigan.

Sincerely,


James Clift

'When you have your health, you have everything.' - Augusten Burroughs

Some of us are physically unable to tolerate the levels of radiofrequency radiation and other electromagnetic fields that others seem to have no problem with.

A few examples:

- Beth ended up in the hospital after sleeping opposite a smart meter.
- Dan experienced sudden dementia, migraines, insomnia, and flu-like symptoms.
- Seth, a 10 year-old-boy, experienced sudden chronic migraine headaches when smart meters were installed just outside his bedroom.
- And Anne experienced severe insomnia and heart palpitations in reaction to electronic meters. Many seated behind me here today have also experienced an array of **adverse health effects** after electronic metering technology was installed on their homes.

Reports of **adverse health effects** as a result of exposure to radiofrequency radiation and other electromagnetic fields, dates back to the turn of the century with switch board operators. In the 1950's, these illnesses became known as radio wave or microwave illness. Today they're we use the terms electromagnetic hypersensitivity (EHS) or shortened to electrosensitivity (ES).

The Architectural and Transportation Barriers Compliance Board (or Access Board) is the Federal agency devoted to the accessibility for people with disabilities. In 2002, the Access Board published that electromagnetic sensitivities can be considered disabilities under the ADA, (the Americans with Disabilities Act), if one's major life activities are adversely affected. Most people adversely affected by electronic metering technology are forced to make major life changes in order to cope with this technology. There's been at least one instance of reasonable accommodation awarded to someone electrosensitive via a Federal HUD complaint, with a number more cases accepted and currently in process.

All electronic public utility meters create "dirty electricity" when switching on or off. DE is an electrical spike that creates radiofrequency static and magnetic effects. In 2010, noted epidemiologist, Samuel Milham, linked DE with

multiple adverse health effects, including heart disease, cancer, diabetes, neurological disorders, and suicide.

The 2012 BioInitiative report was co-authored by 29 scientists worldwide. They found **adverse health effects** from electromagnetic fields and radiofrequency radiation in 88% of the studies they reviewed, and saw an increase in free radicals, which the medical community recognizes can significantly damage living tissues and cells.

In May of 2016, the National Toxicology Program (or NTP) released findings from its largest, and most complex studies ever conducted, on the potential adverse health effects of cell phone radiofrequency radiation. Note that transmitting electronic meters operate in the same radiofrequency range as cell phones. In response to exposure to radiofrequency radiation, some of the rats in the NTP study developed tumors.

And, there are reliable disease biomarkers that objectively characterize and identify electromagnetic sensitivity.

House Bill 4220 is not only about property rights and retaining our right to choose what kind of technology is *or is not* attached to our homes, HB 4220 is about our rights to health, safety, privacy, and general welfare.

Therefore, I ask you to please support HB 4220, a bill that supports the People. Thank you.

Links:

- <http://www.bioinitiative.org/>
- <https://ntp.niehs.nih.gov/results/areas/cellphones/index.html>
- http://web.archive.org/web/20060714175343/ieq.nibs.org/ieq_project.pdf
- <http://thoughtcrimeradio.net/wp-content/uploads/2015/11/EMF-BelPomme-et-al-2015-Reliable-disease-biomarkers-characterizing-and-identifying-electrohypersensitivity-and-multiple-chemical-sensitivit.pdf>

Today I will talk on meter choice legislation in other states, data tracking, and the high costs of electronic meters.

I am Michelle Rison an environmental engineer, receiving my Bachelor's Degree from Michigan Technological University. I have been studying the effects of smart meters since 2011.

Electronic metering technology enables data tracking, which is a property rights, security and privacy issue. Disputes involving electronic metering continue to escalate, including a Michigan foreclosure and a murder investigation. I will also discuss some of the undisclosed costs associated with this technology. Though first, a few facts about utility meter choice legislation in other states:

{Meter Choice in Other States}

There are 21 utilities within 11 states that currently have an analog option for the consumers, 3 states with statewide analogue options, and 5 states in addition to Michigan are considering analogue choice legislation, including, NY, Massachusetts, Missouri, Montana, and Oklahoma.

The state of New Hampshire passed a regulation in 2012 requiring the utilities to get the Property Owner's consent to put smart meters on their homes. The state recognized that a smart meter can serve as a communications portal to electrical appliances, equipment, or devices within the homeowner's residence or business, and can potentially communicate with, monitor, or control them. This constitutes an infringement on a homeowner's property rights if not consented to. While House Bill 4220 does not require consent for a smart or electronic meter, it does provide for property rights protection on an **individual basis**.

{Data Tracking}

As New Hampshire recognized, data tracking, also referred to as privacy, goes hand in hand with property rights. Having a smart meter on the home provides a gateway to gaining information about the activity within the home. Analog meters do not allow for data capture, tracking and misuse. Furthermore, the utility in New Hampshire was able to address the goals of grid management without using smart meters.

Now I'm going to say a bit about the high cost of electronic meters:

Early next week, we will be providing written comments from a financial expert who has over 30 years accounting experience, including in regulated utilities. The following is just one illustration that there is 'more to the story'.

Right now, a utility is asking the Arizona Public Service Commission to increase rates that include replacing smart meters that **were installed just 7 years ago**. Their smart meters are using 2G and 3G networks, which are becoming obsolete. **Analog meters, however, are not dependent upon any networking technology - ever.**

During a congressional hearing, Mr. Bennett Gaines, Senior Vice President and CIO of FirstEnergy, stated that smart meters are computers, and as such, have a lifespan of 5 to 7 years. He also said that retiring smart meters to counter obsolescence needs to occur for two reasons: obsolescence due to technological advances [in computer hardware & software], and also obsolescence induced by cyber threats.

In a rapidly changing technological environment, smart meters, not analog meters, are the devices that become obsolete.

As New Hampshire recognized, the smart meter is more than a metering device. It is a 'networked computer'. Useful lives of computers use a depreciation schedule of 5 years.

The Big Four accounting firm PwC states:

The IRS ... determined that the meter is a computer under asset class 00.12 of Revenue Procedure 87-56 because it shares common features with computers such as a central processing unit with storage and other logic functions. In addition, it is programmable, electronically activated, and is capable of detecting energy tampering or service quality issues.

While the utilities have spread the smart meter roll out costs over 20 years, it is now known 'that the useful life of smart meter equipment is closer to 7-10 years. Since computers do not last 20 years, this misleading accounting method makes it appear as though the smart meters are less expensive than they really are.

While we've been led to believe that analogue meters are obsolete, the exact opposite is the truth, they last 20 to 50 years. It's obvious that several smart meters will need to be installed on each utility customers house in the life of one analogue. Consider as well, that each of these smart meters is more expensive than a simple analogue meter. The savings in favor of the durable, reliable, safe, analogue meter, speaks loudly for itself.

"To summarize"

Analog meters mitigate privacy concerns and they protect our property rights. Analog meters provide protection for the consumers and the utilities - they prevent intentional and unintentional trespassing into our homes a violation of our privacy and property rights. Analog meters guarantee our individual sovereignty providing an impenetrable barrier, a demarcation, between the utility and the customer that smart and electronic meters are not capable of. And, when you read the written testimony addressing analog meter cost savings versus illusional smart meter cost savings, you will see things in a different light.

Please vote to move House Bill 4220 out of committee.



Byron-Gaines Utility Authority

1381 84th Street SE • Byron Center, MI 49315

Phone: (616) 971-0002 • Fax: (616) 554-3655

March 7, 2017

Representative Gary Glenn
House Energy Policy Committee Chairman
124 North Capital Avenue
Lansing, MI 48909

Chairman Glenn and Energy Policy Committee:

Thank you for the opportunity to provide comment on the proposed legislation (House Bill 4220) that is before you today. Please consider the following:

-This bill will impact all Community Water Supplies(CWS), regardless of size, across the State of Michigan. Based on the definitions in the bill, these CWS are grouped with State wide gas and power utility suppliers.

-Many traditional water meters are made of brass with a higher than acceptable lead content. These water meters cannot be reused.

-The accuracy of water meters will typically decrease with age.

-Does the language of HB 4220 intend to include the secondary radio reading unit that transmits water meter readings from a meter in the types of devices a homeowner can refuse to have installed? This type of technology has been in use for many years, is very common in water meter installations, transmits differently from gas or power meters, and should be noted.

Once again, thank you for your consideration in this matter.

Sincerely,

Michael Kortman, Byron-Gaines Utility Authority Manager

The LED lights in your home could be spying on you!
<https://www.youtube.com/watch?v=hliHBeC1sco>

----- Original Message -----

Subject: [EMF] lightbulb hack
From: Patricia Burke <patricia999burke@gmail.com>
Date: Mon, March 06, 2017 1:13 pm
To: ca-emf-safety-coalition new list
<ca-emf-safety-coalition@lists.sonic.net>

<https://www.tripwire.com/state-of-security/security-awareness/thought-seen-iot-needs-us/>

And You Thought You Have Seen It All . . . and Why the IoT Needs Us



ANDREAS MUENNICHOW

MAR 5, 2017 SECURITY AWARENESS



One might think that the security industry is beefing up its message with profanity and far-fetched stories, and you may regard all of it – to an extent – as scare mongering.

The latest attack on the *smart* “HUE Light Bulbs” by Philips puts this views to rest, I hope.

Apparently, modern smart light bulbs are equipped with secure communication protocols, such as ZigBee, some firmware, and lots of processing power.

Attackers recently managed to insert a malware worm into HUE Light Bulbs that damages or destroys the bulb but not without copying itself into the neighboring bulbs within proximity.

This piece of clever code uploads a fake certificate first and implements the code before swinging into action. This is possible by exploiting a number of vulnerabilities that were communicated to Philips earlier this year. The certificate was extracted from a "HUE Light Bulb," and attackers exploited one of them.

Technical details about this attacks can be found in the public domain. Philips said they have closed the gap with firmware updates that were published in October 2016.

The story reminds me of Robert T. Morris and his famous "Internet Worm" released upon the world in 1988. Now, if someone would have told the world back then that a later version of this concept could put the world into darkness by hijacking smart light bulbs, this someone would have lost all credibility.

That a HUE Light Bulb could be *used* for covert operations as a surveillance tool is more than another unpleasant side note.

In the future, we might think twice before we pay a *Nigella Lawson* style visit to the fridge in the middle of the night. Who knows who is listening and watching!

A mature and educated consumer must decide whether or not to introduce so called "smart equipment" (or IoT devices) into the household, which is the most private space and highly protected by many constitutions. But in the not-so-far future, one may not have a choice anymore as the economy of mass production will dictate that a unified product features all options.

The electronics are available at very low cost already, and running a second production batch of the same product without IoT features might not be an option in highly competitive markets.

"Heise Online – Security" *Licht an, Licht aus: ZigBee-Wurm befällt smarte Glühbirnen* 08-NOV-2016

Ca-emf-safety-coalition mailing list

Ca-emf-safety-coalition@lists.sonic.net

<https://lists.sonic.net/mailman/listinfo/ca-emf-safety-coalition>

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National Association for Children and Safe

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Baby Monitors

Every parents needs to know that Baby Monitors:

- Emit microwave radiation constantly while powered on (both the base and the parent handset).
- Have fine print warnings that the device should be 20 cm (8 inches) from the body.
- Are not safe because a baby's brain is developing and is the most vulnerable to damage from microwaves.

CBS News Story ~ Baby Monitors

Wireless Baby Monitor radiation fills a nursery and surrounding rooms because it passes through the walls. Babies will absorb radiation from the monitor all night long. Parents are exposed when they place the receiver near their heads in their bedrooms.

Electronic energy meters' false readings almost six times higher than actual energy consumption

Date:

March 3, 2017

Source:

University of Twente

Summary:

Some electronic energy meters can give false readings that are up to 582% higher than actual energy consumption. The author of a new report estimates that potentially inaccurate meters have been installed in the meter cabinets of at least 750,000 Dutch households.

FULL STORY



Test situation for this study.

Credit: Image courtesy of University of Twente

Some electronic energy meters can give false readings that are up to 582% higher than actual energy consumption. This emerged from a study carried out by the University of Twente (UT), in collaboration with the Amsterdam University of Applied Sciences (AUAS). Professor Frank Leferink of the UT estimates that potentially inaccurate meters have been installed in the meter cabinets of at least 750,000 Dutch households. The is published in the scientific journal *IEEE Electromagnetic Compatibility Magazine*.

In the Netherlands , traditional energy meters (kWh) – the familiar energy meter with a rotating disc – are being increasingly replaced by electronic variants (which are also known as 'static energy meters'). One well-known variant of the latter is the 'smart meter'. The Dutch government wants smart meters in every household by 2020.

Actual consumption

For quite some time now, rumours have been rife about electronic energy meters that give excessively high readings in practice. This prompted Prof. Leferink to investigate electronic meters, to see whether they can indeed give false readings. Together with co-workers Cees Keyer and Anton Melentjev from AUAS, he tested nine different electronic meters in this study. The meters in question were manufactured between 2004 and 2014. The meters were connected, via an electric switchboard, to a range of power-consuming appliances, such as energy saving light bulbs, heaters, LED bulbs and dimmers. The researchers then compared the actual consumption of the system with the electronic energy meter's readings.

582 percent

In the experiments (which were entirely reproducible), five of the nine meters gave readings that were much higher than the actual amount of power consumed. Indeed, in some setups, these were up to 582 percent higher. Conversely, two of the meters gave readings that were 30 percent lower than the actual amount of power consumed.

The greatest inaccuracies were seen when dimmers combined with energy saving light bulbs and LED bulbs were connected to the system. According to Mr Keyer (lecturer Electrical Engineering at the AUAS and PhD student at the UT) "OK, these were laboratory tests, but we deliberately avoided using exceptional conditions. For example, a dimmer and 50 bulbs, while an average household has 47 bulbs."

Explanation

The inaccurate readings are attributed to the energy meter's design, together with the increasing use of modern (often energy-efficient) switching devices. Here, the electricity being consumed no longer has a perfect waveform, instead it acquires an erratic pattern. The designers of modern energy meters have not made sufficient allowance for switching devices of this kind.

When they dismantled the energy meters tested, the researchers found that the ones associated with excessively high readings contained a 'Rogowski Coil' while those associated with excessively low readings contained a 'Hall Sensor'. Frank Leferink (Professor of Electromagnetic Compatibility at the UT) points out that "The energy meters we tested meet all the legal requirements and are certified. These requirements, however, have not made sufficient allowance for modern switching devices."

Consumers

Any consumers who do not trust their energy meter can have it tested by an 'Accredited inspection company'. However, if this inspection shows that the meter is functioning properly, then the consumer will have to cover the costs involved. Yet the standardized test does not make allowance for waveform-contaminating power-consuming appliances. As a result, according to the researchers, it is an unsuitable method for detecting false meter readings. Prof. Leferink and Mr Keyer advise any consumers who doubt their meter readings to contact their supplier, who then will pass the complaint on to the power grid operator.

Story Source:

Materials provided by **University of Twente**. *Note: Content may be edited for style and length.*

Journal Reference:

1. Frank Leferink, Cees Keyer, Anton Melentjev. **Static energy meter errors caused by conducted electromagnetic interference**. *IEEE Electromagnetic Compatibility Magazine*, 2016; 5 (4): 49 DOI: [10.1109/MEMC.2016.7866234](https://doi.org/10.1109/MEMC.2016.7866234)

Cite This Page:

University of Twente. "Electronic energy meters' false readings almost six times higher than actual energy consumption." ScienceDaily. ScienceDaily, 3 March 2017.
www.sciencedaily.com/releases/2017/03/170303180139.htm.

Ca-emf-safety-coalition mailing list

Ca-emf-safety-coalition@lists.sonic.net

<https://lists.sonic.net/mailman/listinfo/ca-emf-safety-coalition>



Regarding Health...

Of course utility companies are going to tell you that their new equipment is safe. That's what they have been told by the manufacturers. The manufacturers claim the equipment is safe because it falls within certain FCC guidelines. They don't mention that [the FCC is *not* a health regulatory agency](#), they are [not protecting the public's health](#), and the [FCC guidelines have been under attack for a number of years](#).

Links: <https://www.fcc.gov/about/overview>, http://www.anticelltowerlawyers.com/anti_cell_lawyer_1_011.htm
<https://emfscientist.org/index.php/emf-scientist-appeal>

The United States is one of three countries that allows about *100 times* more outdoor pulsed radiofrequency radiation than most the rest of the world. Never before in recorded history have over 2 million transmitting public utility meters been installed in Michigan. So we, and other states fitted with electronic public utility meters, are literally functioning as test markets on health effects.

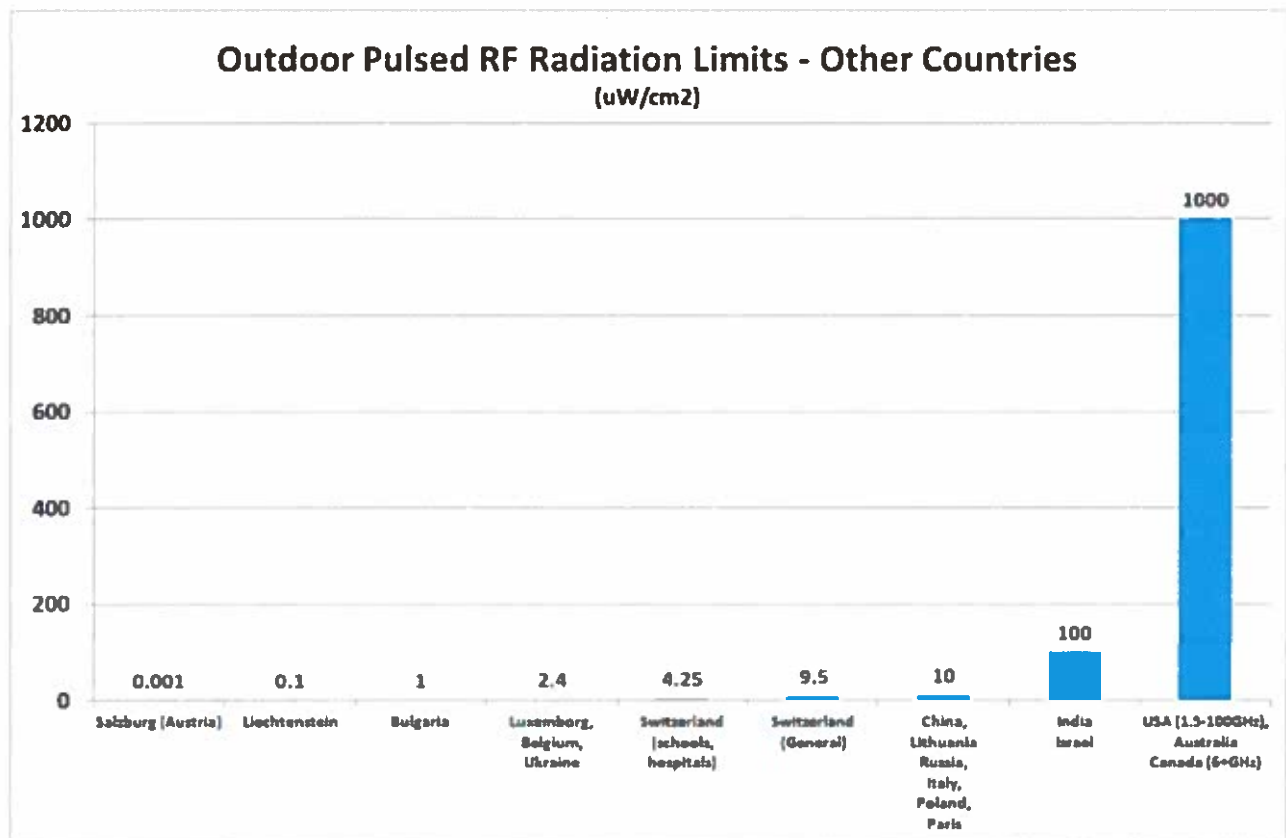


Image from the [Environmental Health Trust](#)

Since the [2014 Michigan Oversight Committee Hearing](#), many more Michigan citizens have come forward, testifying to adverse health effects after electronic public utility meter installation, including myself.

Mr. Kurmas, from DTE, wrote, "the average cell phone produces as much as 100,000 times more RF than an AMI meter." What he did not tell you is: That statement has been challenged by Professor of Nuclear Policy, Daniel Hirsch. [Hirsch states](#) that when corrected for duty-cycle and whole-body exposure, "the cumulative whole body exposure from a Smart Meter at 3 feet appears to be approximately two orders of magnitude *higher* than that of a cell phone, rather than two orders of magnitude lower." Link:

http://www.committeetobridgethegap.org/pdf/110212_RFrad_comments.pdf

As of February of this year, the World Health Organization updated its "[Cancer Fact Sheet](#)" page to include *non-ionizing radiation* as a risk factor under the category "Reducing the Cancer Burden". Electronic "smart" meters emit *pulsed non-ionizing radiation continuously*. Link: <http://www.who.int/mediacentre/factsheets/fs297/en/>

Traditional analog meters do *not* expose us to pulsed non-ionizing radiation, a possible human carcinogen.

Regarding Security...

In March of 2016, Computer Weekly (dot) com, posted an article written by Bryan Glick, titled "[Government warned of smart meter security threat back in 2012](http://www.computerweekly.com/news/4500279800/Government-warned-of-smart-meter-security-threat-back-in-2012)." The article concludes with a call for the "smart" meter project to be "halted, altered or scrapped" immediately to avert an expensive IT failure."

Link: <http://www.computerweekly.com/news/4500279800/Government-warned-of-smart-meter-security-threat-back-in-2012>

Another article, from Security Week (dot) com, written by Eduard Kovacs in January of this year, is titled "[Smart Meters Pose Security Risks to Consumers, Utilities...](http://www.securityweek.com/smart-meters-pose-security-risks-consumers-utilities-researcher)" and begins with, "Serious vulnerabilities in smart electricity meters continue to expose both consumers and electric utilities to cyberattacks."

Link: <http://www.securityweek.com/smart-meters-pose-security-risks-consumers-utilities-researcher>

In his verbal testimony, Mr. Kurmas admitted that the information gathered from a smart meter is akin to the information you would get if you stood in someone's yard right next to their analog gas, electric, and/or water meter. He did *not* say that by doing so, you would be able to tell if someone got up in the middle of the night, slept-in, or even if someone was home, late getting home, or on vacation.

Traditional analog public utility meters do *not* make our homes and our privacy vulnerable.

Regarding Canada...

Mr. Kurmas also stated that in 2012, Canada attained 100% AMI installation.

However, in 2016, [Canada had to "pull the plug"](http://news.nationalpost.com/news/canada/astonishing-hydro-one-pulling-plug-on-36000-rural-smart-meters-after-years-of-complaints) on over 36,000 rural smart meters because of signal issues. At that time, Hydro One of Canada reported that 6% of their one million customers were having billing issues.

Link: <http://news.nationalpost.com/news/canada/astonishing-hydro-one-pulling-plug-on-36000-rural-smart-meters-after-years-of-complaints>

And in 2014, SaskPower of Canada pulled 105,000 smart meters after "[eight unexplained fires associated with the units](http://www.cbc.ca/news/canada/saskatchewan/saskpower-to-remove-105-000-smart-meters-following-fires-1.2723046)." Link: <http://www.cbc.ca/news/canada/saskatchewan/saskpower-to-remove-105-000-smart-meters-following-fires-1.2723046>

In his 14 years of being with the Fire Department, Fire Chief Duane Roddy of Oscoda Township, had never himself witnessed a traditional *analog* meter fire. Yet, as he testified in front of you (Michigan's Energy Policy Committee) on February 21st, within 36 hours of installation, the smart meter on his cabin "arced" and almost caught his cabin on fire. Was that a blessing of disclosure in disguise?

Availability and maintenance...

DTE's Mr. Kurmas also stated that analog meters were not manufactured any longer. There are a couple of different websites I know of where anyone can order an analog electric meter. So they are available. And if the law of supply and demand is true, the supply will follow the demand.

Mr. Kurmas also stated that traditional analog meters needed to be maintained. However, he didn't mention that traditional analog meters have a life expectancy of double (or more) that of AMI smart meters. So they will either be checking traditional analog meters, or totally replacing AMI smart meters, every few years. Is that "more 'green'"?

Written on February 27, 2017 by:

Jeanine Deal

3508 Capital Ave SW

Battle Creek, MI 49015

Phone: 269-965-0461

Email: j.s.deal@att.net

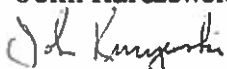
Tuesday, March 7, 2017

Members of this Committee,

"Take our new meter or we will cut your power." With a smirk on his face, Dennis McKee, of Consumers Energy, ordered the power cut to my disabled friend for refusing a digital meter 18 months ago. He boasted the power was cut by HIS authority alone! Consumers Energy is resorting to Gestapo like tactics. The utilities would like you to believe digital meters are not harmful to your health. Don't listen to the man behind the curtain! Dr. David Carpenter, a world recognized expert, gave sworn testimony to our Public Service Commission as to the harmful health effects of smart meters. The Public Service Commission ignored his testimony and approved the smart meters. Let's see, a world expert – the Public Service Commission. I'm going to side with the world expert. Please don't get fooled by the utilities. They like to cite an outdated theory based on that radiation has to be strong enough to warm the skin to do health damage, the Specific Absorption Rate. Thousands of peer reviewed independent scientific studies have proved this to be false. Health damage occurs well below levels that warm the skin. I want to have the choice to decide, after looking at the science, whether I want to gamble with my health using dangerous, non-certified technology. Whether it's health, privacy, fires, or the ability to be hacked, it should be OUR choice whether to accept this technology or not, and NOT the utilities choice by forcing it upon us. I urge you to come down on the side of science in making your decision. 93% of studies concludes wireless radiation at exposure levels far lower than the FCC guidelines causes DNA damage, leading to cancer, neurological diseases, and other serious diseases and impairments.* Consumers Energy likes to proclaim that they have a 90 something per cent acceptance rate for smart meters. The main reason for that, in my opinion, is that media have been reluctant to cover this issue. Walk up to 10 different people and ask them what they know about smart meters. You will find that 1 or maybe 2 will know something about it. I contacted WCMU Public Radio, TV 9&10, TV 7&4, and many national media outlets to do a story on the smart meter controversy. Reporters at each one of them were enthused about the idea. When they sought upper management approval, they were denied. My point is if the public were educated about smart meters, many more would decide to keep their analog meters and the utilities know that. I am asking you to please represent the people who elected you and not allow Consumers Energy to force dangerous, unproven technology on us.

In conclusion, I am asking each member of this Committee to watch a 30 minute You Tube video called, The Dark Side of Smart Meters, by a highly qualified engineer. I'm sure the utilities would prefer that you don't watch this presentation. If after watching, and you're still comfortable having scientifically unproven technology on your home – that's YOUR right. We believe it is just as much OUR right, for whatever reason, NOT to have one of these devices on our home and NOT to be charged for that right other than a meter reading fee, although I AM capable of reading my own meter. Thank you for your time.

John Kurczewski



5323 S STRAITS HWY Apt 20

INDIAN RIVER, MI 49749

231 203 3559

alpenaunclejohn@yahoo.com



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❗ Fri. 24th Feb. 22:00 – Sun. 26th Feb. 04:00 (GMT): Payment facilities unavailable on Taylor & Francis Online, during this period, due to scheduled maintenance.

Journal

Electromagnetic Biology and Medicine >

Volume 35, 2016 - Issue 2

2441 14

Views CrossRef citations

Review Articles



Oxidative mechanisms of biological activity of low-intensity radiofrequency radiation

Igor Yakymenko , Olexandr Tsybulin, Evgeniy Sidorik, Diane Henshel, Olga Kyrylenko & Sergiy Kyrylenko

Pages 186-202 | Received 10 Jan 2015, Accepted 12 Apr 2015, Published online: 07 Jul 2015

 Download citation  <http://dx.doi.org/10.3109/15368378.2015.1043557>

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This review aims to cover experimental data on oxidative effects of low-intensity radiofrequency radiation (RFR) in living cells. Analysis of the currently available peer-reviewed scientific literature reveals molecular effects induced by low-intensity RFR in living cells; this includes significant activation of key pathways generating reactive oxygen species (ROS), activation of peroxidation, oxidative damage of DNA and changes in the activity of antioxidant enzymes. It indicates that among 100 currently available peer-reviewed studies dealing with oxidative effects of low-intensity RFR, in general, 93 confirmed that RFR induces oxidative effects in biological systems. A wide pathogenic potential of the induced ROS and their involvement in cell signaling pathways explains a range of biological/health effects of low-intensity RFR, which include both cancer and non-cancer pathologies. In conclusion, our analysis demonstrates that low-intensity RFR is an expressive oxidative agent for living cells with a high pathogenic potential and that the oxidative stress induced by RFR exposure should be recognized as one of the primary mechanisms of the biological activity of this kind of radiation.

KEYWORDS: Cellular signaling, cancer, free radicals, oxidative stress, radiofrequency radiation, reactive oxygen species



People also read

Resolutions passed against smart meters, or in support of H.B. 4220, The Analog Meter Choice Bill by Counties, Cities, Townships, and Organizations in Michigan.

Presque Isle Republican Party	Gross Point Woods
Oak Park	City of Caro
Livonia	Almont
Shelby Twp	Village of Fairgrove
Macomb County	Dearborn Heights
City of Warren	Vassar Twp
Van Buren Twp	City of Romulus
City of Southfield	Clinton County Republican Party
City of Rochester	Gratiot County Republican Party
Ypsilanti Twp	City of Allen Park
City of Brighton	City of Taylor
City of Rochester Hills	City of Lincoln Park
Oakland County	Charter Twp of West Bloomfield
Brighton Twp	Oakland Party Republican Party
City of Troy	Grosse Point Farms
Sterling Heights	Columbiaville
City of Vassar	Lapeer County
Farmington Hills	City of Brown City
Royal Oak Twp	Marathon Twp
Allegan County	Tuscarora Twp, Indian River
Harrison Twp	Richfield Twp
Village of Reese	more are being passed as awareness is growing.

February 27, 2017

To the House Energy Committee ,

We respectfully Request your indulgence in our DTE situation :

This memo is sent to the Committee to inform the Members of the unfavorable treatment by members of the DTE to us regarding the forced removal of our mechanical meter and the subsequent forced installation of the " Opt Out Meter".

We were repeatedly informed, by mail, in person and written letter that if we did not allow the removal of our old meter that " our service would be terminated " by a stated date.

Several of our Certified Letters to DTE were not honored in any way, only that they were in process of terminating our service. We were treated extremely harsh verbally in personal actions by workers at our door, telephone calls and letters. Actual (DTE Service Man Visit, " I'm here to install your new meter and you better let me install this meter now OR my next visit might not be as pleasant as this one) "

Our pleading to them was absolutely useless. They were not about to be reasonable in any way. Our reasons for not wanting the Opt Out Meter was due to both our health problems and our ages.

Since we were at that time 82 years old and both under doctors care treating my wife for ALZ. Additionally both of us being cancer survivors, along with the usual bevie of advancing age difficulties, no decency was allowed in any way. They were pathetic to deal with.

Since we have the Opt Meter, and are supposed to have the meter read manually each month. We pay additionally for this service. We have NEVER seen a meter reader in all the last two years. We have called DTE repeatedly and requested to have the meter reader knock on our door to let us know that the meter is actually being read manually. Repeatedly we are told " that it is impossible to have this done". It is our true belief that the meter is being read electronically and not manually.

Further we are in the belief that our privacy is being violated through the electronic activity of this meter. From time to time our lights flicker and some of our appliances operate strangely. This is supposedly happening due to the meters " turned Off " operation. Further we feel the meter as operationally " on" rather than "off" as DTE suggests.

We sincerely hope that this information is most helpful to the Members of the Committee in your final analysis of the facts hereby presented for your decision.

Robert W. & Diane E. Shalla
15970 Quail CT.
Macomb Mi. 48044-3231

Robert W. Shalla
Diane E. Shalla

586-247-1666
TBGBS @Comcast.Net

DTE Energy Company
One Energy Plaza, Detroit, MI 48226-1221



April 24, 2015

IMMEDIATE REPLY REQUIRED

Robert W. Shalla
15970 Quail Ct.
Macomb, MI 48044-3231

Regarding: 15970 Quail Ct, Macomb, MI

Dear Mr. Shalla:

This is a follow-up to our letter informing you that the Michigan Public Service (MPSC) approved DTE Electric Company's proposed plan to offer residential customers an opt-out of our Advanced Metering Infrastructure (AMI) Program. Our letter provided you with the requirements for opting out and instructions to contact us if you would like to participate in the Opt-Out Program. Additionally, the letter clearly stated that if you do not contact us to enroll in the Opt-Out Program, we will proceed with the installation of the advanced meter.

During a recent visit to the above address, we found that a locking device was installed that prevented us access to our metering equipment. This condition is unsafe for your family and your neighbors. Pursuant to Michigan Public Service Commission (MPSC) Rule 460.136, a utility may shut off service temporarily for reasons of health or safety. For these reasons, your electric service will be disconnected unless you contact us immediately. If your service is interrupted, you will be required to pay a reconnect fee to have your service restored.

To prevent interruption of your electric service, please call us at 1-800-477-4747 to arrange for an appointment to have the new advanced meter installed. If you have decided to enroll in our Opt-Out Program, make us aware of that decision when you contact us.

Please note that providing access to our metering equipment is not optional-it is a requirement that customers must comply with, and we appreciate your cooperation.

Thank you for being a valued DTE Electric customer.

Sincerely,

Joseph A. McCormick
Manager, Advanced Metering Program

145175000010 0000000 B



05/01/2015

AM1**T008*2*****AUTO**3-DIGIT 480
ROBERT W SHALLA
15970 QUAIL CT
MACOMB MI 48044-3231



RE: 15970 QUAIL CT MACOMB MI 48044-3231 and 145175000010

Dear Robert W Shalla:

In the next few weeks, DTE Energy will begin installing advanced metering in your area. This will include upgrading the electric meter at your home or business. In most cases, installation of the new electric meter is simple, requiring a brief, five-minute interruption to your electric service.

You do not need to be present for the meter upgrade, unless the meter is inside your home or business, or inaccessible. A clear path must be provided for us to gain access to our outside and inside metering equipment, which will require all obstructions or obstacles to be removed prior to the meter upgrade.

During the initial installation period, a meter reader will continue to read the meter until your neighborhood is fully upgraded. If you operate life-support or other sensitive equipment that DTE Energy may not be aware of, please contact us at 800-477-4747.

While you may not see a change in service initially, the benefits, as we continue to install the complete advanced metering system, include:

- Access to your energy usage information
- Automatic power outage detection
- Fewer estimated bills
- No need for us to enter your yard or business for meter reading
- Better integration of renewable energy sources

Be assured that the usage data obtained from the meter is fully encrypted and is only used for billing purposes. No personal data is collected or stored by the meter.

The Michigan Public Service Commission has approved a tariff allowing a non-transmitting meter provision commonly referred to as an Opt-Out Program for residential customers. Customers enrolled in the Opt-Out Program will have a non-transmitting, (radio off) digital meter installed and the following fees applied to their account:

- o \$67.20 AMI Opt-Out Initial Fee
- o \$9.80 AMI Opt-Out Monthly Charge

If you intend to enroll in the Opt-Out Program, please call 800.477.4747 to speak with a customer representative.

Our Advanced Metering program is creating the path to your home's energy future. For more information, please visit us online at dteenergy.com/advancedmeter. We look forward to providing you with this new technology and enhanced level of service.

Sincerely,

The Advanced Metering Team



MICHIGAN ELECTRIC AND GAS ASSOCIATION

110 W. Michigan Ave., Suite 375, Lansing, MI 48933
517.484.7730
517.484.5020 (fax)
www.gomega.org

March 2, 2017

Kevin Gawronski, Committee Clerk
House Energy Policy Committee

Re: HB 4220 (Utility Meters)

Dear Mr. Gawronski:

On behalf of the Michigan Electric and Gas Association (MEGA) member electric and gas public utilities listed below, I am writing to urge that HB 4220 not be voted out of committee with approval. The bill has widespread applicability to newer types of meters already installed in the industry, contains language that potentially has very broad application beyond the purpose of the bill, and addresses matters that are more appropriate for detailed consideration by the Michigan Public Service Commission (MPSC) which has expertise on utility matters.

Member Interest

None of the MEGA utilities have installed 2-way communication “advanced metering infrastructure” (AMI) meters in this state, similar to the DTE and Consumers Energy electric smart meters. However, the definition of “advanced meter” in HB 4220 includes any meters that use radio waves to transmit customer usage data, and even non-transmitting meters with deactivated capability. Most members have installed digital meters that allow reading from a distance using one-way signals. This has saved on the cost of visually reading each meter and the digital meters are accurate. MEGA member utilities are investor owned electric and gas companies serving 300,000 or fewer customers in this state.

Issues of Cost and Practicality

These are some of the concerns expressed by MEGA utilities:

- No \$150 meter charge fee is allowed if the advanced meter was installed before the effective date of the act. Section (5). Thus, any customers who opt-out of the digital meters already in place will not pay for the cost of switching back. Such costs will become part of the overall utility cost of service and borne by the other customers.

Alpena Power Company
Aurora Gas Company
Citizens Gas Fuel Company

Indiana Michigan Power Company
Michigan Gas Utilities
SEMCO Energy Gas Company

Upper Peninsula Power Company
We Energies
WEC Energy Group
Xcel Energy

- The \$5 maximum monthly fee may not cover all costs imposed by this act, depending on the number of customers who opt-out. Additional costs may be added in order to address matters such as separate notice mailings, separate tracking of customers who are ineligible for programs requiring digital meters, manual reads, actions to follow up on missing or erroneous self reads, geographic random dispersal of opt-out customers, and costs of those who do not opt-out but block an installation when the worker arrives. Again, costs could go to the other customers.
- It is unclear what happens where there are banks of meters (e.g. apartment) and one customer opts out. Does the single customer then control the metering of all others at the same location based on a health concern with signals from the other meters?

Other Matters of Concern

- The smart meter opponents have been active in Michigan and across the country in recent years. We are concerned that the complexity of this matter is more appropriate for regulatory review by a body with a greater level of knowledgeable and expertise that needs to consider all aspects of the impacts, and proponents are seeking to rush this through a new committee just starting the learning process on utility matters. We do not seek to ignore or dismiss public health matters, but there is a prior state and national history of examining such issues.
- The MPSC handles metering issues in its administrative rules, including matters such as notice, shutoff protection, limiting estimated reads, testing for accuracy and more. While the legislature obviously has the right and ability to act in such matters, doing so creates parallel paths of service regulation and it is not an easy or flexible process to amend statutes as circumstances change.
- Section (7) requires the MPSC to “fully recognize and value that customers have a legitimate interest in controlling third-party equipment placed onto their property that is not inherently necessary as a condition to receiving service.” This is an advocacy statement with potentially broad implications. What regulatory authority does this convey? What control will customers have? Isn’t measuring and billing usage inherently necessary to provide service?
- The metering industry, often with support and encouragement by government and other interests, has moved beyond electro-mechanical meters to improve accuracy and durability, and allow cost reduction through remote capabilities. Similar advances are occurring in other areas as well – cellular communication, internet Wi-fi, remote access thermostats, garage door openers, appliance remote controls, TV and radio signals, police radar, remote control toys or drones, bluetooth devices and more. The bill proposes to carve out digital metering and apply a presumption of adverse health impacts in one limited area of these common types of transmitting devices.

- Concerns about data privacy and protecting consumer personal information from unauthorized disclosure are legitimate and have been addressed in data privacy tariffs and ongoing cyber-security efforts.
- Whether public health or property rights are the driving force behind the proposal, it makes no sense to target the investor owned and municipal utilities while exempting co-ops, which have installed AMI meters in this state.

We appreciate the work of this committee and the MPSC and respectfully request that the committee take the time to fully consider the issues noted above and develop an appropriate process to address other points of view. We would be able and willing to provide specific information regarding metering technology used by members.

Very truly yours,

A handwritten signature in cursive script that reads "James A. Ault".

James A. Ault, President
Michigan Electric & Gas Association
jaault@gomega.org

cc: Chairman Gary Glenn and all committee members and clerk

Dear Members of the Energy Policy Committee,

Re: **HB 4220** March 5, 2017

My name is Karen Strode. I am a registered pharmacist. I would like to share my concerns about health and homeowners rights.

I was diagnosed with electric hypersensitivity in 2012. (I have included a letter from my doctor as documentation.) My **doctor recommended I transform my home into a "safe haven"** so I could begin to heal. We removed our cordless phone, unplugged the microwave, and hard-wired our internet connection. No cell phone usage was permitted in our home. As it happened, DTE's meter deployment was coming soon to our neighborhood. While completely unaware of DTE's AMI metering program, or even the existence of "smart meters", I had two previous experiences while vacationing on Harsens Island (the location of DTE's pilot). I experienced **electric shock sensations, pain, and flu-like symptoms** while staying in two cottages there. Having since learned of the source of these symptoms, there was no way I could have a smart meter on my home and still be able to live there.

As a homeowner I **thought I would have a say in what goes on my home. I thought I had the right to keep the analog electric meter.** But DTE's opt out program does not allow this. My safe haven would be destroyed and I would become homeless. **We had no alternative utility option** to provide us electric service so we locked our analog electric meter to protect my health.

For three years I lived in fear knowing that at any time DTE could impose their will. In October 2015, **DTE shut off our electricity citing a safety hazard.** We were **forced to get smart metering equipment** and we **took the Opt-Out meter.** Twenty-four hours later I began experiencing excruciating pain. We turned off all but a few electric circuits to run bare necessities like the frig. This enabled me to just barely tolerate the pain and mechanizing ear ringing I experienced.

After **spending close to \$3000 on electrical engineer consultation and electrical work** to install filtering equipment, I was once again able to live peaceably in my own home.

DTE's "**Opt Out meter** is not an acceptable option since it **shares the same technology and design flaws as the smart meter:** one being the lack of proper grounding of the power supply circuit. This creates electromagnetic interference on the electrical wiring, and this interference is what is making people ill, even in the absence of radio transmission. Please see electrical engineer William Bathgate's public comment to the MPSC *Case No. U-18120* for his analysis of smart meter design flaws.

The utility companies continue to cover up the safety and health problems people are experiencing, just as in the handling of the Flint water crisis. The AMI meters themselves are the "hazardous condition!" This is a serious issue with a **simple solution: allow those affected to retain an analog meter!**

Home owners (as well as all utility customers) must have the right to choose the type of metering equipment used to record electricity, gas, or water usage. The analog meter must be one of the choices. It works mechanically, and does not change the quality of electricity in any way.

We need your help to protect our health and preserve homeowners' rights in Michigan. Thank you very much.

Respectfully submitted,

Karen and Thomas Strode
1828 Hamlet Dr.
Ypsilanti MI 48198
734-485-8626

Allergy & Environmental Medicine Center, PLC
Where better health begins

11/03/15

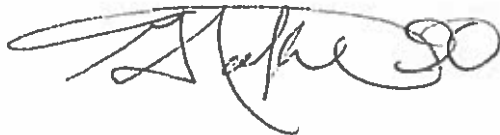
RE: Karen Strode

To Whom It May Concern,

Ms. Strode is a 57 year old female who I've had the pleasure of seeing since March of 2011. She was diagnosed in early 2012 with electromagnetic field sensitivity. Electromagnetic field sensitivity (EMF) is becoming more and more of a common problem. This is due to a variety of forces some of which are secondary to the increase in electromagnetic fields and concentrations in our environment. She is extremely sensitive to specific fields and particularly cannot tolerate smart meter or any other advanced meter radiation. It is in part secondary to the dirty electricity that it produces. She absolutely should not have a smart meter or any other advanced meter placed on her home to monitor energy usage.

If I can provide any further information, please do not hesitate to call me at the above number.

Yours to Optimal Health,



Gerald Natzke, D.O. FAAEM FAAOA



Kevin Gawronski

From: Lisa <lisacigo@aol.com>
Sent: Monday, March 6, 2017 11:03 AM
To: Kevin Gawronski
Subject: HB4220

Hi my name is Lisa Stojkovich. I live in Macomb Township Michigan. We had the smart meter installed on our house a year ago. I've had declining health issues since. I was diagnosed with mononucleosis in September, and now recently I had bronchitis and double ear infection. My son gets numerous bloody noses every month. Prior to the smart meter, I rarely got sick. I was a healthy mother of 2 who enjoyed exercising and biking 20 miles a week. Now I can't exercise, and my bike just sits there collecting dust in the garage. I want my old analog meter back on my house.

Please support HB4220 so other residents can actually have a choice whether to have a smart meter installed or not.

Thank you,
Lisa Stojkovich

Sent from my iPhone

Kevin Gawronski

From: Lisa <lisacigo@aol.com>
Sent: Monday, March 6, 2017 11:03 AM
To: Kevin Gawronski
Subject: HB4220

Hi my name is Lisa Stojkovich. I live in Macomb Township Michigan. We had the smart meter installed on our house a year ago. I've had declining health issues since. I was diagnosed with mononucleosis in September, and now recently I had bronchitis and double ear infection. My son gets numerous bloody noses every month. Prior to the smart meter, I rarely got sick. I was a healthy mother of 2 who enjoyed exercising and biking 20 miles a week. Now I can't exercise, and my bike just sits there collecting dust in the garage. I want my old analog meter back on my house.

Please support HB4220 so other residents can actually have a choice whether to have a smart meter installed or not.

Thank you,
Lisa Stojkovich

Sent from my iPhone

Kevin Gawronski

From: avis love <avislove@sbcglobal.net>
Sent: Monday, March 6, 2017 3:08 PM
To: Kevin Gawronski
Subject: Smart Meters NOT WANTED

Greetings,

I am a disabled citizen with my analog meter of which I desire to keep. I am not comfortable with the idea of dirty electricity coming into my home.

This isn't my first communication I simply want my objection to be noted.

All new technology is not necessarily beneficial to the health and safety of the public.

Please rally against this unreasonable demand for the Smart Meter. The OPT OUT is a farce they want us to pay for it! NO to all of this.

I don't want monitoring of my home activity the analog meter does it just fine. DTE is still getting paid. Quality of Life should be first. Thank You fr taking the time to read this.

Healthy Regards,

Avis Love (Inkster, Michigan

Kevin Gawronski

From: Lisa <lisacigo@aol.com>
Sent: Monday, March 6, 2017 11:03 AM
To: Kevin Gawronski
Subject: HB4220

Hi my name is Lisa Stojkovich. I live in Macomb Township Michigan. We had the smart meter installed on our house a year ago. I've had declining health issues since. I was diagnosed with mononucleosis in September, and now recently I had bronchitis and double ear infection. My son gets numerous bloody noses every month. Prior to the smart meter, I rarely got sick. I was a healthy mother of 2 who enjoyed exercising and biking 20 miles a week. Now I can't exercise, and my bike just sits there collecting dust in the garage. I want my old analog meter back on my house.

Please support HB4220 so other residents can actually have a choice whether to have a smart meter installed or not.

Thank you,
Lisa Stojkovich

Sent from my iPhone

Kevin Gawronski

From: matthew schoech <kingsleyphoenix@hotmail.com>
Sent: Monday, March 6, 2017 11:28 AM
To: Kevin Gawronski
Subject: I Support HB 4220

Dear Representatives,
Ref. A Bill to Amend 1939 PA 3

At long last a Bill of real freedom of choice on what type of electric meter is installed at my residence. I live in Traverse City, and I strongly urge you to pass HB 4220

Also, the passage of this Bill should not include any rate change should I decline to have an advanced meter installed at my place of residence, or, conversely if I should decide to have one installed.

The Utility companies can give much bigger donations to the campaigns of some elected officials and that, I would consider, is a violation of trust that I would be ever watchful for.

Thank you, for your consideration on this issue.

Matthew and Christine Schoech
306 W. 9th St
Traverse City, MI 49684

Kevin Gawronski

From: Sara Perron <sara@millssales.com>
Sent: Monday, March 6, 2017 12:07 PM
To: Kevin Gawronski
Subject: HB 4220

Dear Mr. Gawronski:

Please vote for HB 4220 (with the addition of a provision for keeping our analog meters) would give all residential and business customers in Michigan the right to choose what type of meter is installed on their home or business.

I already have two autoimmune diseases and think a Smart Meter with its dirty electricity would only exacerbate my health problems.

Please also consider the privacy issue which a Smart meter compromises, and the fire hazards posed by Smart Meters.

We must be allowed to choose which type of meter is best for us as individuals.

Sincerely,

Sara K. Perron
38148 Beecher Drive
Sterling Heights, MI 48312

March 6, 2017

House Energy Committee Hearing – March 7, 2017
Anderson House Office Building
Room 519

Care of: Mr. Kevin Gawronski
From: Thomas & Sheila Pomaranski, Shelby Township, MI

This document is to encourage you to support HB 4220 on behalf of your constituents. It is our understanding that HB 4220 would allow utility customers the **CHOICE** on the type of equipment used to measure utility usage. We are strong advocates of the use of Analog Meters as opposed to the mandated Advanced Metering Devices.

We have deep concerns over the Advanced Metering Devices and their health implications. After recovering from a grave cancer diagnosis, we have learned much about the types of influences that can have significant health implications, including those contributing to a cancer diagnosis, which is a disturbance in cellular function.

It is well documented that *radiofrequency radiation (RF)* or *microwave radiation*, operates at levels that are harmful to the functioning of our cells. Our bodies communicate through electromagnetic and chemical signals, so the Advanced Metering Devices and where they fall on the electromagnetic spectrum matters.

It is extremely important that our homes, at a minimum, are a safe haven from any harmful devices, especially those that we **HAVE NOT CHOSEN** to install on our homes. For some people, the effects of these Advanced Metering Devices and the emitting radiation can be felt immediately. For others, it may show up as significant health challenges that are not so readily identifiable over time from being over-inundated with this pulsed and spiked Radiation Frequency.

Who is at risk? You are at risk, your children and grandchildren are at greater risk and the community as a whole is at risk for significant health problems in the very near future.

We are asking that you simply give your constituents a **CHOICE** on the metering devices installed on their homes. We need your help in preserving our rights in the state of Michigan and supporting HB 4220.

Thank you for your time and consideration.

Thomas and Sheila Pomaranski

Kevin Gawronski

From: mpalicz3@aol.com
Sent: Monday, March 6, 2017 1:26 PM
To: Kevin Gawronski
Subject: Fwd: HB 4220 - Utility Meter Choice

Mr. K. Gawronski
Clerk
Energy Committee

Mr. Gawronski:

SUBJECT: HB 4220

Please give your support to HB 4220 - Utility Meter Choice which allows the residents of Michigan to have a meter choice of Analog vs. Smart Meter. The 'Smart Meter' shoved down our throats is a means for DTE Energy, a monopoly, to monitor and control our heat, light, A/C and other energy devices. They have started down this road by shaming residential customers who are deemed to be energy hogs.

Please help to avoid creating DTE as the energy czar of Michigan by voting for HB 4220,

Marlene Palicz
Walled Lake MI 48390



Wireless.

Smart Meters.

Is Your Health Protected?

It is absolutely critical that all Americans actively support biologically-based safety limits for radiation from wireless devices.

Why should EVERYONE actively support biologically-based safety limits for radiation from wireless devices and therefore sign the [petition to move responsibility for RF safety limits to an agency responsible for protecting health and the environment](#)

Because YOUR health could be on the line. Please take the time to watch the videos below about the toxic effects radiation from wireless devices has. Surely your health is worth 20 minutes or so. Most people are completely unaware of the toxic soup they live in which might cause them to experience headaches, poor sleep, and various other symptoms. The damage is progressive and dose is related to physical characteristics, including mass, and 24 hour exposure levels. These exposures have changed rapidly over the last few years.

[Cellphones cause cancer even on standby \(the setting wherein the phone receives calls\)](#). The short news story centers around young women with breast cancer from their cellphones, compelling medical imaging included. Risks of testicular, abdominal, and pancreatic cancer may well be elevated because cellphones are typically carried nearby.

[Fetal exposure to cellphone radiation linked to later behavior and cognitive problems similar to ADD in mice - a controlled study](#). These findings support the findings of a

large (over 13,000 child) epidemiological study that found that children whose mothers use cellphones during and after pregnancy are at greater risk for behavior problems

Cardiac Arrhythmias in response to a DECT cordless phone unequivocally documented. Many people report similar effects from wifi and are, in fact, excluded from social events and civil society by the ubiquitous presence of wifi and sources of wireless radiation.

Radiation dangers in your home - Most people have no idea! You do have control over many of your most immediate RF radiation exposures. Watch this video to get an eye-opening look at how much radiation beloved wireless devices emit. Biologically the levels are not low.

Why wifi should not be in schools

Many people are paying an awful price for the world's love affair with wireless technology. Our lack of meaningful biologically-based RF safety limits are forcing individuals who have become overexposed and therefore highly reactive to RF radiation to seek shelter in rural areas, undeveloped areas, or areas with limited wireless availability.

The FCC has shown again, even as it opens a docket to determine whether it should take another look at its RF radiation limits, that it cannot do so in an unbiased manner.

The FCC's primary function is to promote telecommunications technologies by licensing providers of these technologies. By its own statements, its expertise is not public health. **Public health is too important to let the fox continue to guard the henhouse.**

It is time for the responsibility for public health to be separated from the promotion of the wireless industry.

With the almost-ubiquitous exposure of the entire US population to RF radiation, it is past time that US policy for non-ionizing radiation protection follow the model in place for the ionizing radiation protection.

It is extremely important that EPA's research funding and RF regulatory authority be unequivocally supported, because the FCC cannot both promote wireless technologies and regulate RF radiation. This inherent conflict was recognized when the Atomic Energy Commission was disbanded and its prior development/promotional responsibilities were separated from its responsibility to protect the public health and

safety. (The former was transferred to the Department of Energy and the later to the Nuclear Regulatory Commission.)

A recent report released by The EMRadiation Policy Institute (<http://www.marketwire.com/press-release/-1770139.htm>) shows not only that the FCC has not modernized its RF radiation safety limits to reflect current science, but that it does not even enforce its own outdated thermally-based RF radiation safety regulations, highlighting the need for another agency to take over responsibility for the public health. A Wall Street Journal investigation reports similar findings with one in ten towers out of compliance and experts concerned that out of compliance towers will be transmitting in the thermal range by around the end of 2015.

Until the late 1980s the EPA carried out its own non-ionizing radiation research program. Unfortunately, the EPA's mandate for developing non-ionizing radiation safety regulations was never fully funded. Its non-ionizing radiation regulatory authority has been eroded by industry lobbying, most significantly in the lead-up to passage of the Telecommunications Act of 1996 which gave the FCC sole authority for adopting RF safety regulations.

Hundreds of comments to recent FCC dockets (http://apps.fcc.gov/ecfs/comment_search/input?z=iw0f and search proceedings 03-137 and 12-357) support the need for biologically-based RF radiation safety limits NOW!

Additional information available at the petition site.

Sign the petition to move responsibility for RF safety limits to an agency responsible for protecting health and the environment

AND

the Protect Birds & Health petition asking Congress and the President to start protecting our health and the environment from radiation from wireless technology.

BioInitiative 2012 - A Rationale for Biologically-based Exposure Standards for Low-Intensity Electromagnetic Radiation

Please help circulate the press release and information about the BioInitiative 2012 widely.

Press Release:

BioInitiative 2012 Report Issues New Warnings on Wireless and EMF
University at Albany /Rensselaer, New York. January 7, 2013

A new report by the BioInitiative Working Group 2012 says that evidence for risks to health has substantially increased since 2007 from electromagnetic fields and wireless technologies (radiofrequency radiation). The Report reviews over 1800 new scientific studies. Cell phone users, parents-to-be, young children and pregnant women are at particular risk.

"There is a consistent pattern of increased risk for glioma (a malignant brain tumor) and acoustic neuroma with use of mobile and cordless phones" says Lennart Hardell, MD at Orebro University, Sweden. "Epidemiological evidence shows that radiofrequency should be classified as a human carcinogen. The existing FCC/IEEE and ICNIRP public safety limits and reference levels are not adequate to protect public health."

A dozen new studies link cell phone radiation to sperm damage. Even a cell phone in the pocket or on a belt may harm sperm DNA, result in misshapen sperm, and impair fertility in men. Laptop computers with wireless internet connections can damage DNA in sperm.

Based on strong evidence for vulnerable biology in autism, EMF/RFR can plausibly increase autism risk and symptoms. *"While we aggressively investigate the links between autism disorders and wireless technologies, we should minimize wireless and EMF exposures for people with autism disorders, children of all ages, people planning a baby, and during pregnancy," says Martha Herbert, MD, PhD.*

Wireless devices such as phones and laptops used by pregnant women may alter brain development of the fetus. This has been linked in both animal and human studies to hyperactivity, learning and behavior problems.

According to David O. Carpenter, MD, co-editor:

"There is now much more evidence of risks to health affecting billions of people world-wide. The status quo is not acceptable in light of the evidence for harm."

This study covers EMF from powerlines, electrical wiring, appliances and hand-held devices; and from wireless technologies (cell and cordless phones, cell towers, 'smart meters', WI-FI, wireless laptops, wireless routers, baby monitors, and other electronic

devices). Health topics include damage to DNA and genes, effects on memory, learning, behavior, attention, sleep disruption, cancer and neurological diseases like Alzheimer's disease. New safety standards are urgently needed for protection against EMF and wireless exposures that now appear everywhere in daily life.

The BioInitiative 2012 Report is available at: www.bioinitiative.org.

Visit [BioInitiative 2012 Conclusions](#) to read a summary of the conclusions of this detailed review of the literature.

Please circulate the [BioInitiative 2012](#) press release widely.

For a video about the very real consequences of not having meaningful biologically-based safety limits for radiation from wireless devices, please watch this video about cellphones causing [breast cancer](#)

Read "[Is your beloved cell phone killing you? Turn it on, keep it close and watch the results](#)" by Steve Elwart, P.E., Ph.D. He is the executive research analyst with the Koinonia Institute and a subject matter expert for the Department of Homeland Security.

What can you do to protect your family, friends, and loved ones?

- First, pass on the information and press release above.
- Second, visit the [Solutions page](#) to find out what steps you can take within your own home to significantly reduce your family's exposure to radiofrequency radiation - you will be surprised how much control you do have to significantly reduce your family's exposure.
- Third, support biologically-based radiofrequency radiation safety limits. Follow this [link](#) to find out how.
- Fourth, support universal access to fiber optic internet to the premises (with no wireless router at the premises) - similar to telephone service or electrification. It is the safe, green, state-of-the-art internet connection. Follow this link to [find out more](#).
- Fifth, help stop the use of [Transmitting Utility Meters](#).

Fund Fiber Optic Broadband, NOT Wireless Broadband

The United States is planning its future broadband infrastructure. Public input asking

for safe, secure, reliable, extremely high speed, and energy efficient is needed. Fiber optic broadband delivers all these. **Support Fiber Optic Broadband.**

Why?

Fiber optic broadband is the state-of-the-art gold standard in broadband. **It is far and away the highest speed, highest capacity, and most reliable option for broadband.** Wireless isn't even close. Furthermore, it is **safe, secure, and energy efficient.**

(Find out more)

Going Off-Grid Safely

People, including us, who are contending with illness due to exposure to radiofrequency radiation either from "dirty" power or transmitted radiofrequency radiation (wireless technology) often think that going off-grid with a DC (direct current) electrical system will solve their problems.

*Unless the system is carefully researched and engineered, meticulously installed, and then appropriate filtering is installed to eliminate the radiofrequency signals that inevitably result from the operation of most components available today, this will **NOT** be the case.*

To read more, please visit [Going Off-Grid Safely](#)

Modern Wind Turbines Generate Dangerously "Dirty" Electricity

Wind turbines are causing serious health problems. These health problems are often associated, by the people having them, with the flicker and the noise from the wind turbines. This often leads to reports being discounted.

Residents of the area around the Ripley Wind Farm in Ontario where Enercon E82 wind turbines are installed feel that the turbines are making them ill. Residents suffer from ringing in the ears, headaches, sleeplessness, dangerously elevated blood pressure (requiring medication), heart palpitations, itching in the ears, eye watering, earaches, and pressure on the chest causing them to fight to breathe. The symptoms disappear when the residents leave the area. Four residents were forced to move out of their homes, the symptoms were so bad. Residents also complain of poor radio, TV and satellite dish reception. There is no radio reception under or near the power lines from the wind turbines because there is too much interference. Local farmers have found that they get headaches driving along near those power lines.

To read the rest of the article please click here:[Wind Turbines](#)

Melrose-Mindoro School District in western Wisconsin found "sick" building syndrome caused by electrical pollution, not mold

Teachers at a school in the Melrose-Mindoro School District noticed a marked improvement in their health after Graham-Stetzer Electrical Pollution Filters were installed in the school. Superintendent Ron Perry said "The staff were unaware what work was being done. They only knew an electrical contractor was working in the building. Within days I had people asking me what had been done, they knew something had been, since they felt so much better."

The school had previously been categorized as a "sick" building and the Wisconsin Department of Health had blamed a supposed mold problem. Extensive and costly cleaning and painting was done to clean up the mold problem, but did nothing to alleviate the symptoms the staff experienced.

Due to knowledge one of the board members had about the human health effects of electrical pollution, Mr. Stetzer was called in to do measurements and ultimately to install Graham-Stetzer filters, eliminating exposure to high frequencies from the electrical pollution. The increase in modern electronics inside the school and "dirty" power from similar sources outside the school were to blame.

Installing the electrical filters turned out to be much less expensive than completing what would have been the next phase of the mold cleanup. The school district is also saving money because teacher absences were dramatically reduced after the filters were installed. In addition to saving money, greater continuity due to few teacher absences leads to better quality education. In short, Superintendent Perry was very happy with the results and felt others should be made aware of the problem.

"Electrical pollution takes its toll on school" is a recent article that ran in the Melrose Chronicle.

"School staff ill from electricity use" is the original article that ran in the Melrose Chronicle. You may have to scroll down to read the original article since commentary is also posted there.

A letter from the school nurse, Char Sbraggia R.N., regarding changes in the health of faculty and students in the Melrose-Mindoro School District since the installation of the Graham-Stetzer Electrical Pollution Filters.

A follow-up letter from the school nurse, Char Sbraggia R.N., written two years after

the installation of the Graham-Stetzer Electrical Pollution Filters in the Melrose-Mindoro School District.

An essay by Angela Olstad, Mindoro Fourth Grade Teacher/Building Principal, about electrical pollution and their experience: Explainable Health Conditions.

A follow-up essay by Angela Olstad, Mindoro Fourth Grade Teacher/Building Principal, written two years after filters discovering electrical pollution was the cause of her illness: Surviving in this world....

Related news from other schools:

A paper titled **Power quality affects teacher wellbeing and student behavior in three Minnesota Schools**, published in Science of the Total Environment, July 2008.

A paper titled **A New Electromagnetic Exposure Metric: High Frequency Voltage Transients Associated With Increased Cancer Incidence in Teachers in a California School** published in the American Journal of Industrial Medicine, 2008.

"Bangor School District spends \$15,000 on electrical filters" is a recent article that ran in the West Salem Coulee News, Wisconsin.

A paper titled **"Teacher and Student Response to the Removal of Dirty Electricity by the Graham/Stetzer Filter in Willowwood School in Toronto, Canada"**

Analysis of a waveform from a Minnesota school

Letter sent to Chairperson Jensen by a fourth grade class in Wisconsin in support of the "Electrical Consumer Bill of Rights," Wisconsin Assembly Bill 529 (AB529)

Let others know about the dangers posed by high frequencies with these handouts:

Summary of the effects of electrical pollution in schools and the benefits of cleaning it up

Open letter on the dangers of WiFi

Here is a parent-run website dedicated to getting WiFi out of schools due to the serious hazards it poses to students:

<http://www.safeschool.ca>

Mitigation of Electrical Pollution in the Home

In "Mitigation of Electrical Pollution in the Home," released on 19 April 2002, Professor Emeritus at University of California in Berkeley Dr. Martin Graham discusses how people can cheaply and easily identify whether they are exposed to electrical pollution, as well as, a safe easy way to mitigate the problem once it is identified.

In the paper, he discusses the use of small portable filters which plug into standard electrical outlets to reduce/eliminate exposure to electrical pollution. Dr. Graham provided pictures of spectra of electrical pollution from a spectrum analyzer that also demonstrates the filter efficacy.



[Filter available from Stetzer Electric](#)
(Click to enlarge)

Approximately 20 such filters are needed to reduce exposure to electrical pollution in the average home. In order to adequately filter the home, it is important to install a sufficient number of filters from the start. The installation instructions below can be used to help determine how many are needed.



[Meter available from Stetzer Electric](#)
(Click to enlarge)

The Microsurge Meter, developed and patented by Dr. Graham, plugs into an electrical outlet giving a continuous reading of the electrical pollution levels on the wiring. The meter measures the energy in the radio frequency range riding on the 60 or 50 Hz sine wave.

The Microsurge Meter has been standardized against the existing sanitary standards for exposure to high frequencies for the Republic of Kazakhstan. In November 2003, the government of the Republic of Kazakhstan issued sanitary norms governing electrical pollution on building wiring which set the highest allowable reading for building wiring at 50 on the Microsurge Meter. ("Permissible levels of high-frequency electromagnetic pollutions' voltage in a wires of industrial frequency alternating current: Sanitary-epidemiologic norms" and the decree on "On measures of decreasing of negative influence of physical factors on human health") Readings over 50 are required to be reduced to less than 50 using filters or some other means. They recognize that an acceptable level of 50 is not the same as a safe level.

My personal experience, corroborated by others recovering from radiowave sickness, has been that levels need to be below 20 for me

not to be sick, the farther below 20 the better.

Instructions for filter installation can be found at <https://www.stetzerelectric.com/stetzerizer/installation/>

UL approved Stetzerizer filters and the Microsurge Meter are available from Stetzer Electric, Inc.

Stetzer Electric can be reached by phone at (608) 989-2571 or at their website <http://www.stetzerelectric.com/>. Questions can be directed to sales@stetzerelectric.com

Disclaimer: The webmaster is a recovering patient, motivated by a desire to learn and teach about electrical pollution, who does not make filters or possess any financial interest in the company that produces them.

Some Important Sources of High Frequencies Can Be Easy and Relatively Inexpensive to Mitigate

Large motors with variable-speed frequency drives (VFD) generate large amounts of high frequencies if the proper filters have not been installed. Pacific Gas & Electric even has a page on their website dealing with problems caused by unfiltered VFDs. Installation of the filters, called harmonic noise filters, is required in many European countries. In the United States, however, filters are frequently omitted to save money or because their importance is not understood or both. The filters can cost as little as \$35, depending on the manufacturer and model of the VFD (relatively little compared to the initial cost of the VFD motor itself).

Variable speed frequency drives are used in various commercial, industrial, and agricultural applications. On the commercial/industrial side applications are numerous and can include assembly lines, ventilation fans, and pumps. In agriculture, motors with variable-speed frequency drives can be found in various applications including milking machines and ventilation fans.

Many other sources of high frequencies can be found in industry. One such example is arc furnaces. They generate large amounts of high frequencies which can be relatively easy to "clean up" in consultation with a power quality specialist. A competent power quality specialist can identify and remedy sources of high frequencies.

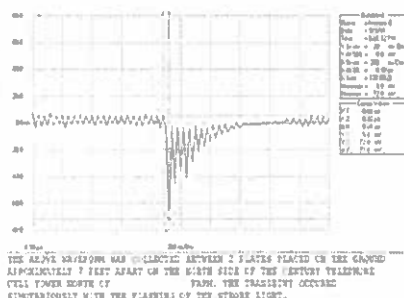
Why bother? The July 5, 1999 issue of *Fortune* (industrial issue) states that "Dirty power costs U.S. industry anywhere from \$4 billion to \$6 billion a year, according to

Karl Stahlkopf, a vice president at the utility financed Electric Power Research Institute (EPRI). "Due to insufficient isolation between the phase wires and the primary neutral, "cleaning up" the power returning to the utilities will "clean up" the power coming from the utilities. "Cleaner" power can pay great dividends by extending equipment lifetime and reducing down time. Furthermore, "cleaner" power would reduce human and animal exposure to high frequencies, thereby reducing the incidence and severity of symptoms of radio wave sickness, leading to a healthier more productive future.

Strobing cell-tower lights installed without the RF Choke are hazardous to your health.

In May 2001 some very high frequency signals appeared on equipment monitoring electrical ground currents at a few dairy farms in Wisconsin. The signal was traced to a nearby cell tower whose rotating beacon light had just recently been changed to a strobing light. The origin of the signal was verified by shutting off the strobing light momentarily. The signal on the monitoring equipment disappeared while the light was off. The signal starts at about 25 MHz and rings down from there. It is produced when the capacitors, which store up the 1000 volts or more needed to strobe the light, release that energy all at once to strobe the light. Therefore, a high frequency and high voltage impulse is released each time the light flashes. If the RF Choke is in place and the utilities wires are adequate to carry the current back to the substation, there is no problem. However, many companies, not realizing the problem they cause, have opted to save the approximately \$30 and omit the filter. The utility system, in many areas, cannot return such a high frequency high voltage impulse to the substation on the neutral wire, as it should. Therefore, it takes the path of least resistance back to the substation. The path of least resistance is not always the shortest path. Problems have been found as far as 6 miles from the tower.

People unfortunate enough to live in the return path may experience symptoms of Radiofrequency Sickness.



(Click to enlarge)

These can include: sleeplessness or disturbed sleep, fever, rash, nausea, inability to concentrate, thinking in a fog, short-term memory problems, sore joints particularly hip joints, irritable bowel syndrome, miscarriage, and birth defects. Symptoms, particularly the fever, clear up outside of the exposure area as long as there is not continued exposure to high frequencies from another source. Dairy farms unfortunate enough to be in the path may experience decreased milk production,

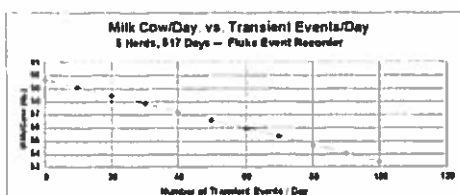
longer milking time, poor cow coat and health, miscarriages, difficulty breeding cows back, and difficulty getting cows to eat and drink properly.

These problems can be substantially cleared up by the cell tower companies if they install the approximately \$30 filter. Additionally, cell tower companies should install filters on the electronic equipment running at the towers, so that they are in compliance with the IEEE-519 rules. An ordinance requiring compliance with the IEEE-519 was passed recently at the county level in a county in Wisconsin. Follow the link to obtain [information to assist with passage of a similar ordinance by your local zoning board.](#)

"Stray Voltage," not stray at all

"Stray Voltage" is merely another name for electrical ground current. Electrical ground current is electrical current returning to the substation through the earth. Electrical ground currents occur when the utility's wire is no longer the path of least resistance back to the substation. Electricity always follows the path of least resistance. Once it is off the wire, that path often includes plumbing, people, and animals, in addition to the earth. Calling the returning electrical ground currents "stray voltage" was a stroke of genius. The name "stray voltage" trivializes the problem and suggests unknown and unknowable origin, which is not true at all. **Preliminary data suggest that dairies with "stray voltage" problems actually have both "dirty" power and electrical ground currents.**

The Electrical Power Research Institute (EPRI) and the Institute of Electrical and Electronics Engineers (IEEE), as well as some individual utility companies have identified solutions for electrical ground currents and "dirty" power. The solutions include larger primary neutral wires and/or filters to reduce the amount of high frequencies present. According to EPRI "A method that practically eliminates ground currents associated with primary distribution lines and still maintains the advantages of a four-wire multi-grounded system, is the five-wire system...(excerpt from Handbook for the Assessment and Management of Magnetic Fields Caused by Distribution Lines)." An April 2002 IEEE paper entitled "Five-wire Distribution System Demonstration Project" contains similar findings.



Graph excerpted from Milk Production of Dairy Herd Decreased by Transient Voltage Events by Hillman et al
(Click to enlarge)

The review article by Dr. Donald Hillman, Professor Emeritus, Department of Animal Science, Michigan State University Effects of Electrical Shock on Cattle and abstract for the paper entitled Milk Production of Dairy Herd Decreased by Transient Voltage Events contain important information about electrical pollution for dairy producers.

An article in Wisconsin State Journal on Monday, August 23, 2004 by Tom Sheehan, "Current May Have An Effect On Cows Exposure May Affect Immune Systems But Study Can't Conclude Whether It Affects Cows' Ability To Fight Disease" discusses research at University of Wisconsin - Madison on the effect of exposure to low levels of electrical current. (As you read the article, keep in mind that the exposure period was only three weeks. Most cows live in the polluted environment 24 hours a day, 7 days a week all year. Imagine what they might have found with a realistic exposure length. It is also unclear if the current used was representative of the current waveform found on farms with ground current problems when a sensitive oscilloscope with a large frequency range is used.)

Kevin Cawronski

My name is John A Detroyer from Emmett Mich. This is about smart meters that I do not want. First my analog meter is locked out so I don't have a smart meter yet.

DTE say they are safe, they don't know or care its all about money to them. With all the cell phones, microwave etc out there I can't believe that in the long run there are not the causes of a lot of cancer. Smart meters will be one more cause added to that list. Plus the government knows enough of my business smart meters invade our privacy even more. DTE says it will be cheaper for us I have friends that have them and there bills went up. We should have a choice we have enough things we have no choice about. Im 61 the smart meters may not kill me before something else does but what about all the children that has to live with these meters for 80 or so years. You know they will only be the beginning of more. Thanks

Testimony in Favor of House Bill 4220

My name is Shane Trejo, and I am the State Director of the Michigan Tenth Amendment Center. In addition, I work on public policy for the national Tenth Amendment Center throughout the country. My primary focus is legislation related to important privacy issues as well as other issues pertaining to the Bill of Rights. I wanted to provide expert testimony about how Smart Meters harm privacy rights in a myriad of invasive ways.

First and foremost, the proliferation of smart meters creates significant privacy concerns. The data collected can tell anybody who holds it a great deal about what goes on inside a home. It can reveal when residents are at home, asleep or on vacation. It can also pinpoint "unusual" energy use, and could someday serve to help enforce "energy usage" regulations.

The American Civil Liberties Union (ACLU) stated in a report¹, "The temptation to use the information that will be collected from customers for something other than managing electrical loads will be strong – as it has been for cell phone tracking data and GPS information. Police may want to know your general comings and goings or whether you're growing marijuana in your basement under grow lights. Advertisers will want the information to sell you a new washing machine to replace the energy hog you got as a wedding present 20 years ago. Information flowing in a smart grid will become more and more 'granular' as the system develops."

These privacy issues aren't merely theoretical. According to information obtained by the California ACLU, utility companies in the state have disclosed information gathered by smart meters on thousands of customers. San Diego Gas and Electric alone disclosed data on more than 4,000 customers. The vast majority of disclosures were in response to subpoenas by government agencies in drug cases or to track down individuals, according to a San Francisco Gate report².

Thankfully, states are not compelled to participate in these Smart Meter programs. Smart Meter technology must be adopted voluntarily by the states, who can simply not participate. HB4220 would make that possible. Opting out follows a strategy James Madison advised in Federalist #46³. "Refusal to cooperate with officers of the Union" provides a powerful means to fight back against government overreach. Such actions in multiple states would likely be effective in bringing down invasive Smart Meter programs.

For all of these reasons and many more, I urge you all to do the right thing for your constituents and pass HB4220 to give the consumers the choice to opt-out from being forced to use this dangerous technology.

Sincerely,

Shane Trejo

State Director

Michigan Tenth Amendment Center

1 "Vermont ACLU warns of AML data risks, pushes own guidelines", Published May 19, 2014
<https://www.smartgridtoday.com/public/Vermont-ACLU-warns-of-AML-data-risks-pushes-own-guidelines.cfm>

2 "Calif. utilities yield energy-use data" by David R. Baker, Published June 19, 2013
<http://www.sfgate.com/business/article/Calif-utilities-yield-energy-use-data-4611159.php>

3 "The Federalist No. 46 - The Influence of the State and Federal Governments Compared" by James Madison, originally published Jan. 29, 1788
<http://www.constitution.org/fed/federa46.htm>

Andrew Krupp
168 Cloverport Ave.
Rochester Hills, MI.
48307

Monday March 6, 2017

House Energy Committee,

I am writing to ask for your support for HB 4220 and analog utility metering choice here in Michigan. I wanted to share some of the simpler and less discussed facts that I hope you will take into serious consideration while reviewing this matter. Thank you for your time.

- The utility companies have done a very good job publically stating the positive qualities regarding the Itron smart/advanced meters. However to date, they have not publically acknowledged or presented a detailed discussion on the well-documented risks to privacy, safety or health associated with the meters except to say that these concerns do not exist.
- The FCC limits for exposure to radiofrequency radiation were set in the 1970's. Many in the scientific community view the limits as too high and are now again reviewing them. The standards were set before we had the amount of electronics that we use now daily. Currently the limits do not take into account the accumulative effects from the several electronic/smart devices, appliances we use and from smart electric, gas and water meters our homes.
- The Itron meters are made with a poorer quality plastic than our analog meters were. This plastic breaks down very quickly and also makes the meters more prone to fire incidents.

- The Itron meters have a documented 5-15 year lifespan. Analog meters 50-100 years. When the Itron meters break down in 5-15 years, who is going to pay for the new cost of replacement that we did not have with the analog meters, the company or the consumer?

- For just \$1.70 per unit, Itron/utility companies could have put a filter on each meter that would have mitigated many of the safety and health concerns with the meters and they made a decision not to.

- Because the Itron meters are themselves electrical devices, like all electrical devices they are susceptible to the elements, temperature, etc. But they are not built to the same standard as other electrical devices and are not UL rated.

-When discussing the level of radiation/RF that the Itron meters give off, the utilities add up the amount of radiation output and divide it over a 24-hour period versus calculating at the much higher levels of actual exposure during each singular transmission.

-We can choose to have a smart TV, baby monitor, cell phone etc. in our life/homes and these items can be used, not used, or unplugged as chosen by each individual. Currently we are not given the choice of whether to have a smart/advanced utility meter and these meters are powered 24/7 and are out of the homeowners control.

-Analog meters are still available. The Hialeah Meter Company has millions of analog meters in stock and they are all fully calibrated to ANSI standards.

- Lastly and very important the current opt-out is not a viable alternative to the smart/advanced meters and presents many of the same safety, privacy

and health issues. Thankfully analog mechanical metering is a simple, affordable and viable solution that resolves them all.